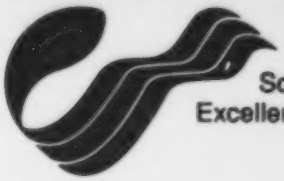

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Summary of North Atlantic Fish Recruitment 1942 - 1987

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Canada

Canadian Technical Report of Fisheries and Aquatic Sciences

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Summary of North Atlantic Fish Recruitment 1942-1987

by

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Abstract

Myers, R. A., W. Blanchard and K. R. Thompson 1990. Summary of North Atlantic Fish Recruitment 1942-1987. Can Tech. Rep. Fish. Aquat. Sci. 1743: iii + 108 p.

The recruitment variability in 100 North Atlantic stocks was examined. This report lists the available data and provides plots of the log-transformed values. Additional displays are provided so that the reader can assess the degree of autocorrelation within each series (*i.e.* the persistence of anomalous recruitment from year to year) and the assumption of normality often assumed in the statistical analysis of log-transformed recruitment.

Résumé

Myers, R. A., W. Blanchard and K. R. Thompson 1990. Résumé de données de recrutement pour les poissons de l'Atlantique Nord 1942-1987. Can Tech. Rep. Fish. Aquat. Sci. 1743: iii + 108 p.

Nous avons examiné la variabilité de recrutement parmi 100 stocks de l'Atlantique Nord. Ce rapport liste les données disponibles et procure des graphiques des valeurs transformées logarithmiquement. Nous avons produit d'autres graphiques afin que le lecteur puisse réaliser le degré d'autocorrélation parmi chaque serie (par exemple la persistence de recrutement anormal d'année en année) et la présomption courante de normalité dans les analyses statistiques de données de recrutement transformées logarithmiquement.

INTRODUCTION

As part of an ongoing study of recruitment variability in the North Atlantic, we have compiled 100 time series of annual recruitment. This report lists the available data and provides plots of the log–transformed values. (Logarithm to base 10 has been used throughout.) Additional displays are provided so the reader can assess the degree of autocorrelation within each series (*i.e.* the persistence of anomalous recruitment from year to year) and the assumption of normality often assumed in the statistical analysis of log–transformed recruitment.

DATA

Recruitment has been estimated either from research surveys (RV) or by sequential population analysis (SPA). The latter includes such techniques as virtual population analysis (Gulland 1965), cohort analysis (Pope 1972), and related methods which reconstruct population size from catch at age data. Recruitment indices from research surveys were usually calculated using more than one age. An index for a given stock was constructed by averaging two or more ages of the same cohort after the data had been standardized by subtracting the mean and dividing by the standard deviation, calculated over some common time period. The common mean was then added to the standardized series.

The stock boundaries generally follow those of the Northwest Atlantic Fisheries Organization (NAFO) or the International Council for the Exploration of the Sea (ICES). They are given in Figure 1. We sometimes refer to the region by an alternative name, *e.g.* the North Sea, if it commonly applies to the stock in practice, or if the NAFO or ICES regions do not adequately describe the presently used stock boundaries. The NAFO boundaries do not describe the herring stocks around the island of Newfoundland; see Winters and Wheeler (1987) for the stock boundaries used. Similarly, the stock boundaries used for the Baltic are complex; see the ICES assessment documents for definitions of these subregions.

There are two nonoverlapping time series for haddock from NAFO regions 3NO and 3Ps. These time series have not been merged because there is no overlap between them.

Recruitment data were compiled directly from assessment documents except for 3 redfish stocks (4VWX, 3NO, and 3Ps); these data were estimated as part of a separate study (Myers and Drinkwater 1988, 1989). Recruitment data were taken from assessments from the National Marine Fisheries Service (USA) laboratory at Woods Hole, the Canadian Atlantic Fisheries Scientific Advisory Committee (CAFSAC), the Northwest Atlantic Fisheries Organization (NAFO), the International Council for the Exploration of the Seas (ICES), and the Marine Research Institute, Iceland. Two older series were taken from the predecessor to NAFO, the International Commission for the Northwest Atlantic Fisheries (ICNAF).

We have used the accepted North American names for species (Leim and Scott 1966). We hope this does not cause confusion in the case of pollock *(Pollachius virens)* and American Plaice *(Hippoglossoides platessoides)* which are known as saithe and long rough dab respectively in Britain.

DESCRIPTION OF THE FIGURES

For each of the 100 time series there is a separate page of subplots and text.

At the top of each page there are up to six lines of text which define the stock, the number of data points available (N), data sources and any relevant comments. There is also an alphanumeric name, *i.e.* AMPL3LNO. The method used to estimate recruitment, SPA or RV, is also given. The numbers in parentheses after "RV" are the ages used to estimate recruitment.

For each stock there are three time series:

(i) log-recruitment is denoted by $\log R$ in the text and by a solid lines in all the figures;

(ii) Detrended log-recruitment is denoted by $\mathrm{dlog}\, R$ in the text and by the dashed lines in all the figures. It is defined implicitly by

$$\log R = a_0 + a_1 Y + \mathrm{d}\log R \tag{1}$$

where a_1 is the linear slope, determined by least squares, and Y is the year;

(iii) First-differenced log-recruitment is denoted by $\nabla \log R$ in the text and by the dash-dot line in the figures. It is defined by

$$\nabla \log R_{t+\frac{1}{2}} = \log R_t - \log R_{t-1} \tag{2}$$

Note that the first-diffenced values have been shifted by 1/2 to account for the differencing operation. The $\log R$ data can be found at the bottom of each page.

PANEL ONE (TOP LEFT-HAND CORNER)

This panel shows the interannual variability of $\log R$, $\mathrm{dlog}\, R$ and $\nabla \log R$. The mean has been removed prior to plotting. The mean of $\log R$ and the linear slope (a_1) are specified on the line just above this panel. The sample standard deviation, defined by

$$s^2 = \frac{1}{N}\sum_{t=1}^{N}(X_t - \overline{X})^2. \tag{3}$$

for each of the three series is shown just below this panel in the following order: $\log R$, $\mathrm{dlog}\, R$, and $\nabla \log R$.

Suppose we first difference a purely random process (*i.e.* one with no serial correlation). It is straightforward to show that first-differencing will double the variance. Consider now the statistic

$$\text{VAR RATIO} = \frac{s^2_{\nabla \log R}}{2s^2_{\log R}} \tag{1}$$

where $s^2_{\log R}$ and $s^2_{\nabla \log R}$ are the sample variances of the log-transformed and first-differenced series respectively. One would expect this ratio to be unity if $\log R$ is a purely random process, i.e. that s.d. is $\sqrt{2}$ bigger for $\nabla \log R$: if it is significantly less than unity it indicates persistence of anomalous recruitment from year to year.

PANEL TWO (TOP RIGHT-HAND CORNER)

The panel shows the normal scores plots of the three time series. It provides a visual display and a test statistic, to assess the weight of evidence against the null hypothesis that $\log R$, $\mathrm{dlog}\, R$ and $\nabla \log R$ are normally distributed.

The subplot was produced as follows:

(i) standardize the sample (*i.e.* subtract the mean and divide by the standard deviation):

(ii) sort standardized values into an ascending sequence;

(iii) for the *ith* sorted value compute its normal score, $(i - \frac{3}{8})/(N + \frac{1}{4})$, and then determine the corresponding normal quantile from the normal distribution.

(iv) plot normal quantiles on the y-axis (from (iii)) and the sample quantiles on the x-axis (from (ii)).

The test statistic is the Pearson correlation coefficient between the normal and sample quantiles. The correlation coefficients appear on the line directly below this panel in the following order: log R, dlog R and ∇ log R. Cryer (1986) gives the following table to assess the significance of a departure from normality.

N	$\alpha = 0.01$	$\alpha = 0.05$
10	0.880	0.918
15	0.911	0.938
20	0.929	0.950
25	0.941	0.958
30	0.949	0.964
40	0.960	0.972
50	0.966	0.976
60	0.971	0.980

PANEL THREE (LOWER LEFT-HAND CORNER)

This panel shows the sample autocorrelation function of each of the three time series. It was calculated as follows:

$$r(k) = \frac{1}{s^2 N} \sum_{t=1}^{N-k} (X_t - \overline{X})(X_{t+k} - \overline{X}). \tag{5}$$

The autocorrelation function is only shown for lags up to 20. The lag one autocorrelations appears on the line just below this panel in the following order: log R, dlog R and ∇ log R.

PANEL FOUR (LOWER RIGHT-HAND CORNER)

This panel shows the normalized integrated spectrum of each of the three time series. For the definition of the normalized integrated spectrum, first

note that the sample normalized spectrum is simply (*e.g.* Priestley, 1981)

$$f(\omega) = \frac{1}{2\pi} \sum_{k=-N}^{N} r(k) \cos(k\omega). \quad -\pi \leq \omega \leq \pi \tag{6}$$

and the integrated spectrum is

$$F(\omega) = \int_{-\pi}^{\omega} f(\omega) d\omega. \tag{7}$$

We define the integral time scale τ by $F(2\pi/\tau) = 0.5$ *i.e.* that period for which one half of the energy lies below and one half lies above this period. For example, if a process was purely random, then it would possess a linear integrated spectrum and τ would equal 4 time units.

The figure shows the integrated spectrum plotted against frequency in cycles per year for each of the three time series. The integrated spectrum was calculated using a Fast Fourier Transform routine. The integral time scale TAU is shown on the line just below this panel, for log R, dlog R and ∇ log R respectively.

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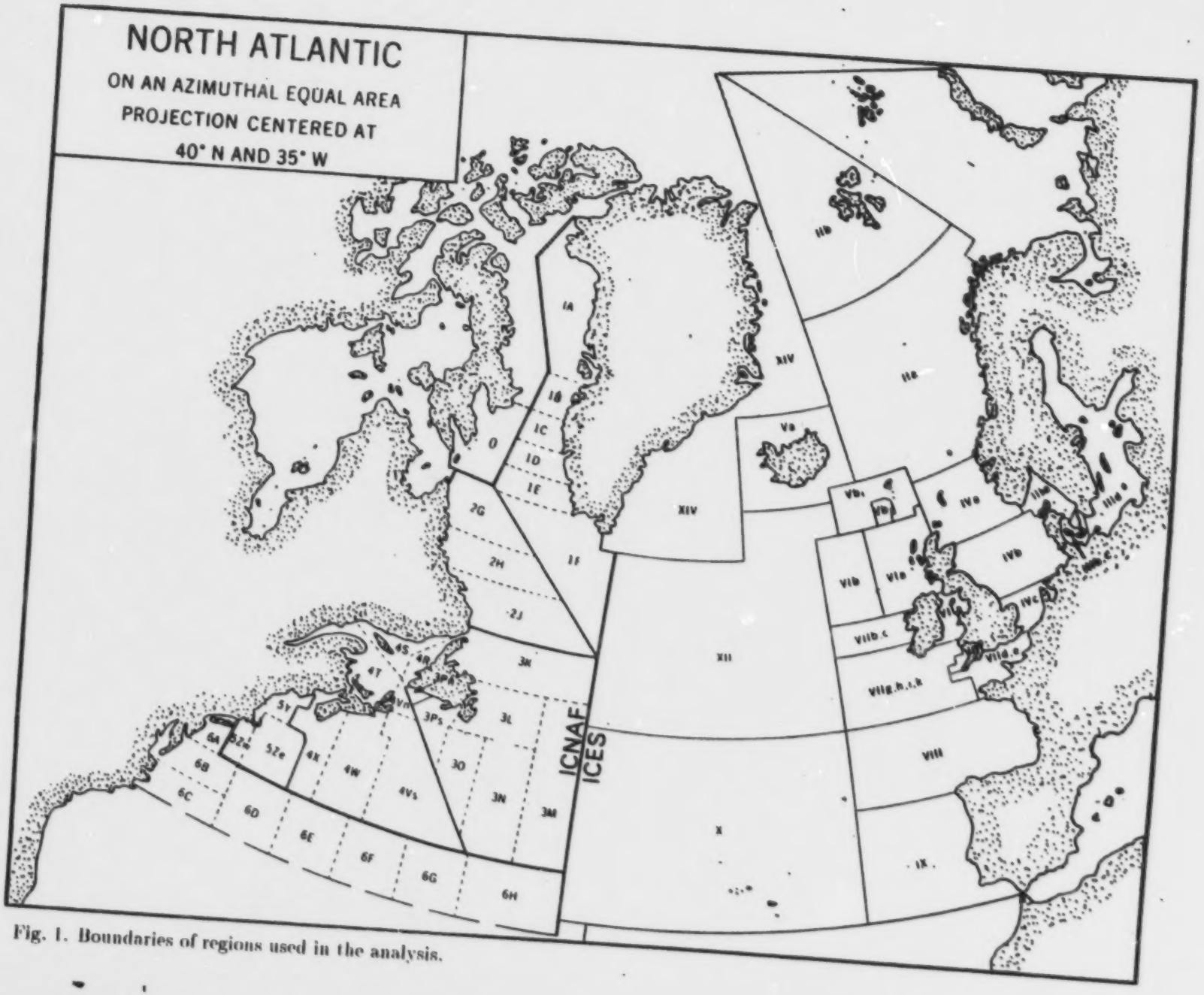
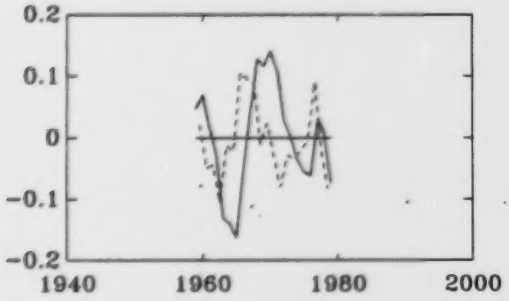


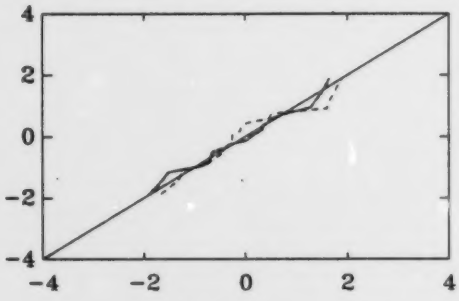
Fig. 1. Boundaries of regions used in the analysis.

AMERICAN PLAICE 3LNO AMPL3LNO
START YEAR - 59 END YEAR - 79 NUMBER OF DATA POINTS - 21
SOURCE: Brodie, NAFO SCR Doc. 88/37.

COMMENTS: SPA, 6 year olds in (000's).

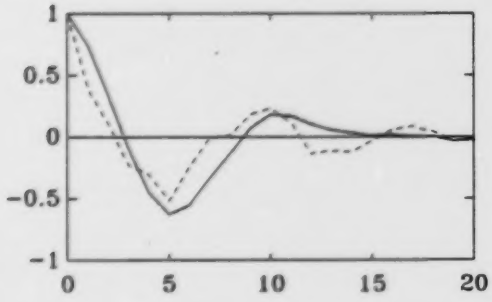
AMPL3LNO MEAN = 5.217 SLOPE = 0.000 VAR RATIO = 0.241 N = 21

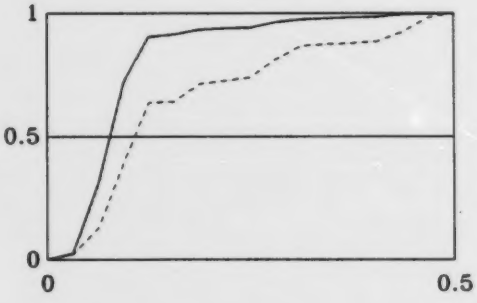




SD (0.085, 0.085, 0.059)

RHO (0.989, 0.990, 0.960)





ACF(1) (0.743, 0.741, 0.385)

TAU (13.003, 12.955, 9.280)

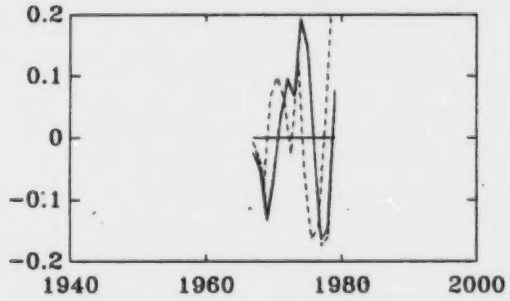
Log Transformed (base 10) Recruitment Data

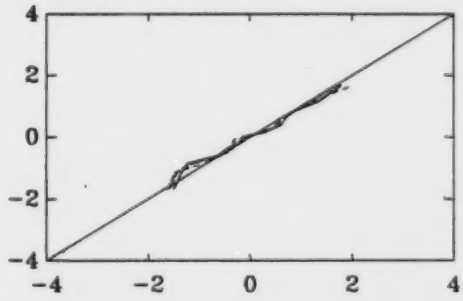
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	5.263	50-59
5.286	5.235	5.191	5.087	5.076	5.054	5.159	5.256	5.345	5.333	60-69
5.358	5.327	5.247	5.219	5.184	5.162	5.157	5.248	5.227	5.144	70-79
..	..	..	..	..	..	..	..	..	..	80-89

AMERICAN PLAICE 3Ps AMPL3Ps
START YEAR = 67 END YEAR = 79 NUMBER OF DATA POINTS = 13
SOURCE: Brodie NAFO SCR Doc. 88/75.

COMMENTS: SPA, 6 year olds in (000's).

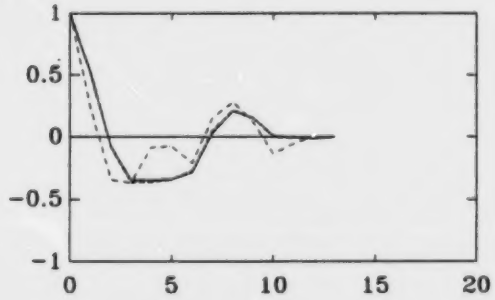
AMPL3Ps MEAN = 4.218 SLOPE = 0.003 VAR RATIO = 0.502 N = 13

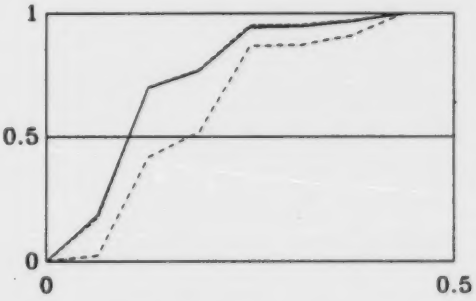




SD (0.109, 0.108, 0.109)

RHO (0.989, 0.993, 0.990)





ACF(1) (0.513, 0.519, 0.227)

TAU (9.915, 9.890, 5.702)

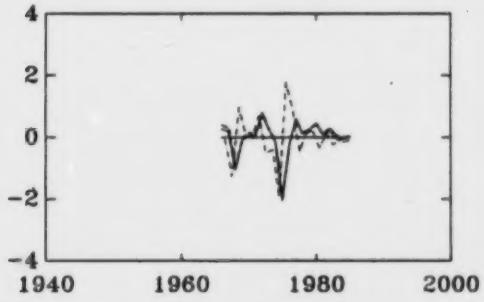
Log Transformed (base 10) Recruitment Data

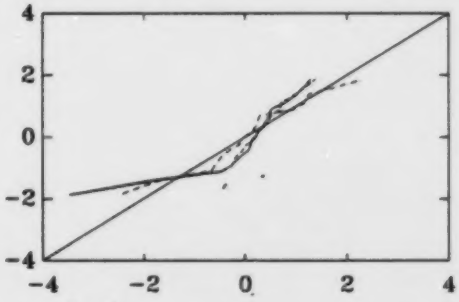
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	..	..	4.194	4.165	4.083	60-69
4.148	4.247	4.311	4.284	4.412	4.365	4.202	4.054	4.071	4.292	70-79
..	..	..	..	..	..	..	..	..	..	80-89

AMERICAN PLAICE 4V AMPL4V
START YEAR = 66 END YEAR = 85 NUMBER OF DATA POINTS = 20
SOURCE: Neilson and Perley, CAFSAC 86/48, updated by Neilson

COMMENTS: RV(3+4) index * 1000.

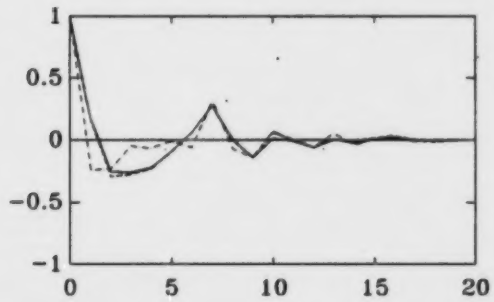
AMPL4V MEAN = 3.052 SLOPE = 0.014 VAR RATIO = 0.864 N = 20

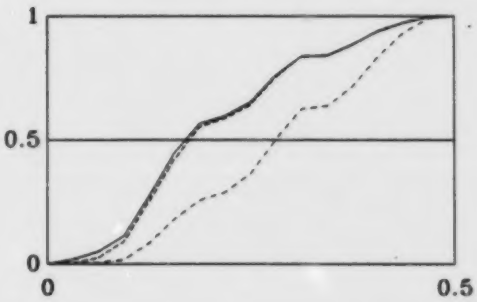




SD (0.594, 0.589, 0.780)

RHO (0.853, 0.867, 0.966)





ACF(1) (0.173, 0.151, -0.242)

TAU (5.876, 5.711, 3.565)

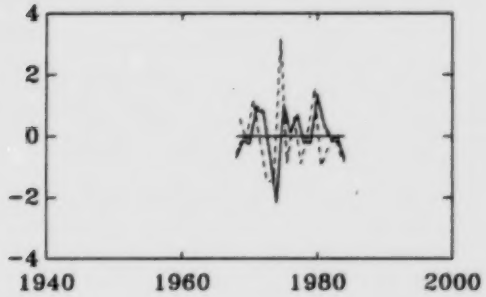
Log Transformed (base 10) Recruitment Data

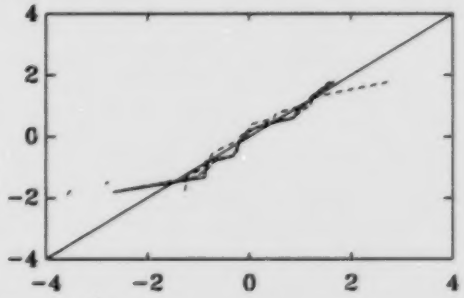
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	..	3.330	3.260	1.983	2.953	60-69
3.137	3.112	3.818	3.292	2.896	1.000	2.776	3.664	3.195	3.312	70-79
3.530	3.188	3.357	3.124	3.016	3.093	..	..	..	..	80-89

ARGENTINE 4VWX ARGEN4VWX
START YEAR = 68 END YEAR = 84 NUMBER OF DATA POINTS = 17
SOURCE: Dale and Halliday, CAFSAC Res. Doc. 87/19, updated by Halliday.

COMMENTS: RV(2), index * 1000.

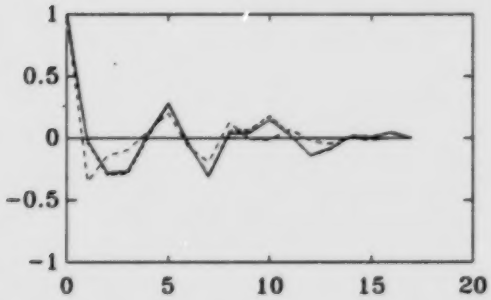
ARGEN4VWX MEAN = 3.186 SLOPE = 0.018 VAR RATIO = 1.036 N = 17

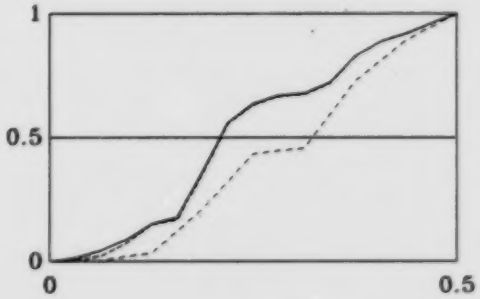




SD (0.815, 0.811, 1.174)

RHO (0.961, 0.962, 0.950)





ACF(1) (-0.020, -0.034, -0.350)

TAU (4.777, 4.751, 3.103)

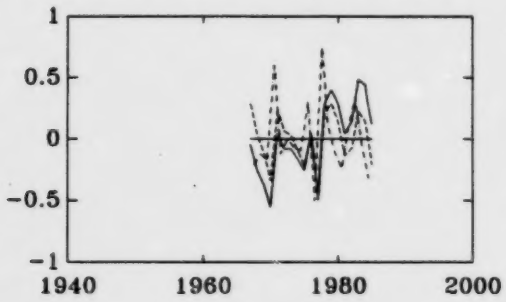
Log Transformed (base 10) Recruitment Data

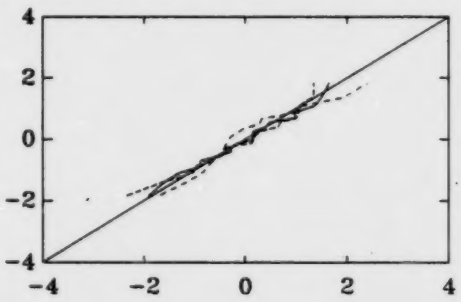
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	..	..	..	2.477	3.040	60-69
2.903	4.079	3.929	2.477	1.000	4.176	3.301	3.903	3.000	3.000	70-79
4.544	3.556	3.146	3.146	2.477	..	..	..	..	..	80-89

BUTTERFISH 5 & 6 BUTTER56
START YEAR = 67 END YEAR = 85 NUMBER OF DATA POINTS = 19
SOURCE: Woods Hole Ref. Doc. 86-09

COMMENTS: RV(0+1).

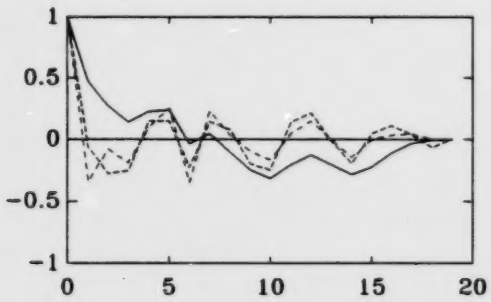
BUTTER56 MEAN = 0.160 SLOPE = 0.037 VAR RATIO = 0.551 N = 19

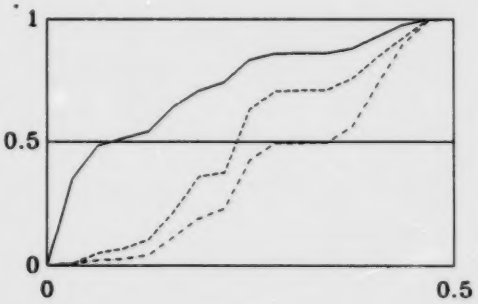




SD (0.293, 0.213, 0.308)

RHO (0.992, 0.977, 0.956)





ACF(1) (0.473, −0.065, −0.344)

TAU (12.708, 4.273, 2.893)

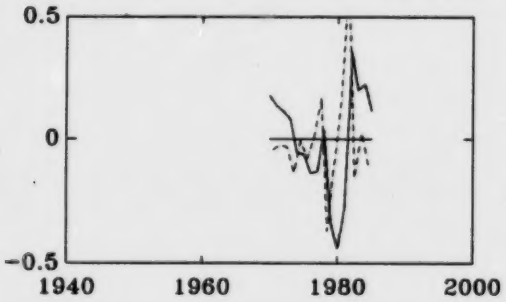
Log Transformed (base 10) Recruitment Data

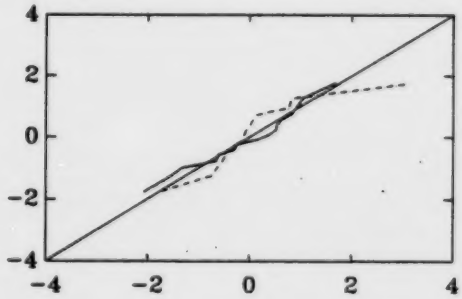
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	..	..	0.114	-0.097	-0.223	60-69
-0.398	0.204	0.079	0.079	0.000	-0.097	0.204	-0.301	0.447	0.556	70-79
0.447	0.204	0.301	0.643	0.602	0.279	..	..	..	..	80-89

BLUE WHITING NORTHERN AREA BWHITNA
START YEAR - 70 END YEAR - 85 NUMBER OF DATA POINTS - 16
SOURCE: Report of the Blue Whiting Assesment Working Group ICES, C.M.1988.

COMMENTS: SPA, 0 year olds in (000 000's).

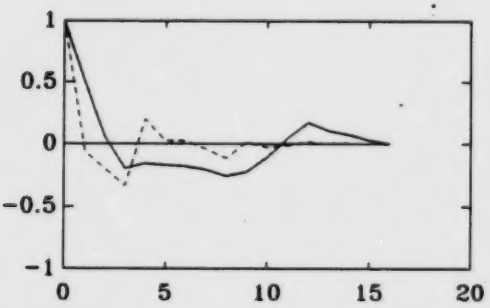
BWHITNA MEAN = 4.209 SLOPE = -0.000 VAR RATIO = 0.495 N = 16

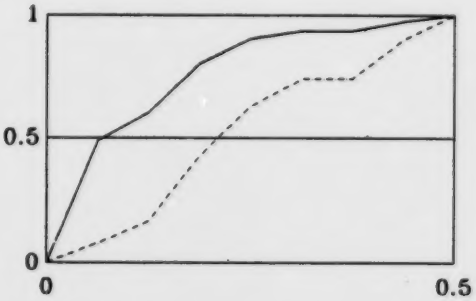




SD (0.213, 0.213, 0.212)

RHO (0.981, 0.982, 0.894)





ACF(1) (0.505, 0.506, -0.058)

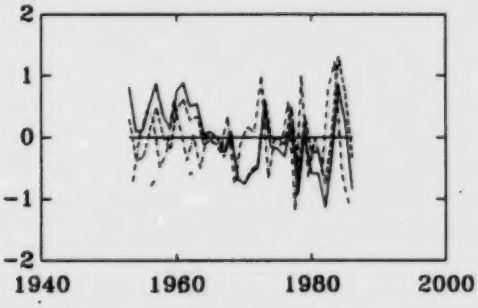
TAU (14.659, 14.520, 4.756)

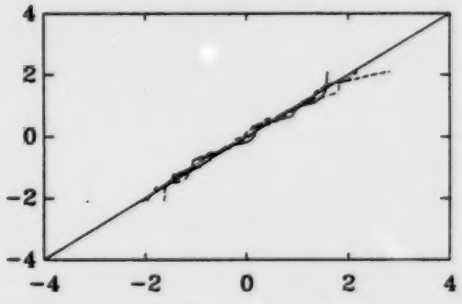
Log Transformed (base 10) Recruitment Data

..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	..	..	..	..	..	60-69
4.387	4.344	4.322	4.290	4.155	4.149	4.072	4.079	4.246	3.875	70-79
3.771	3.929	4.566	4.407	4.433	4.322	..	..	..	..	80-89

COD 1 COD1
START YEAR = 53 END YEAR = 86 NUMBER OF DATA POINTS = 34
SOURCE: Hansen and Buch, NAFO SRC Doc. 85/62, updated by Hovgard, Greenland Inst.
COMMENTS: SPA, 3 year olds in (000 000's).

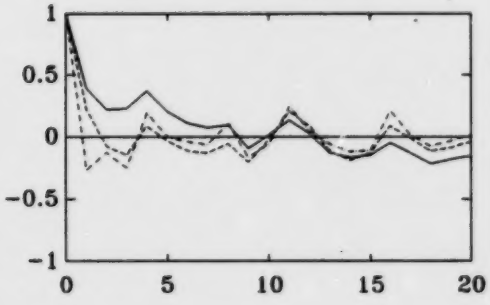
COD1 MEAN = 1.841 SLOPE = -0.031 VAR RATIO = 0.554 N = 34

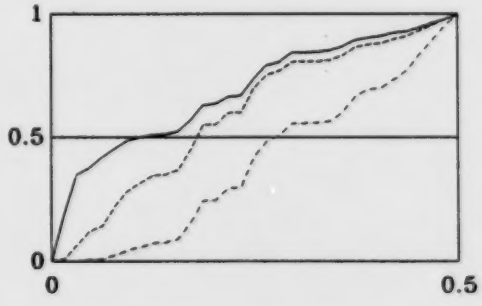




SD (0.556, 0.464, 0.585)

RHO (0.988, 0.985, 0.992)





ACF(1) (0.393, 0.215, -0.271)

TAU (9.168, 5.560, 3.610)

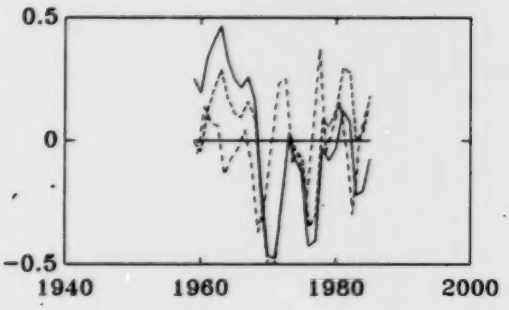
Log Transformed (base 10) Recruitment Data

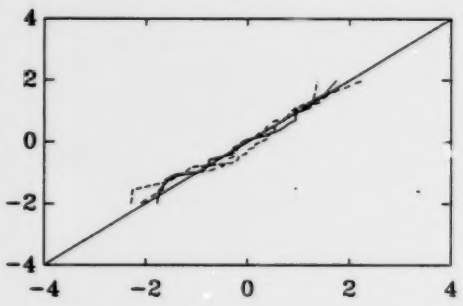
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	2.654	1.934	1.959	2.393	2.713	2.215	1.978	50-59
2.592	2.724	2.352	2.387	1.886	1.934	1.839	1.602	1.944	1.176	60-69
1.079	1.255	1.342	2.358	1.690	1.663	1.531	2.100	0.903	1.909	70-79
1.255	1.255	0.699	1.477	2.699	2.097	1.000	..	..	..	80-89

COD 2J3KL COD2J3KL
START YEAR = 59 END YEAR = 85 NUMBER OF DATA POINTS = 27
SOURCE: Baird and Bishop, CAFSAC Res. Doc. 87/42 updated by Baird.

COMMENTS: SPA, 3 year olds in (000's).

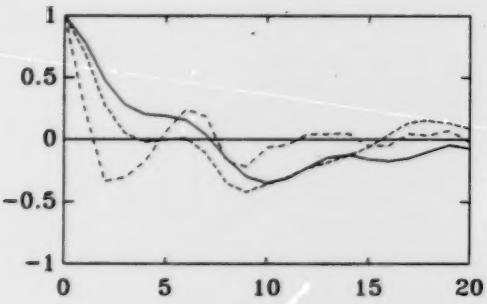
COD2J3KL MEAN = 5.611 SLOPE = -0.020 VAR RATIO = 0.203 N = 27

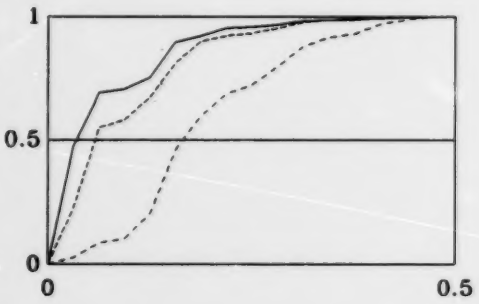




SD (0.268, 0.219, 0.171)

RHO (0.987, 0.955, 0.986)





ACF(1) (0.786, 0.695, 0.238)

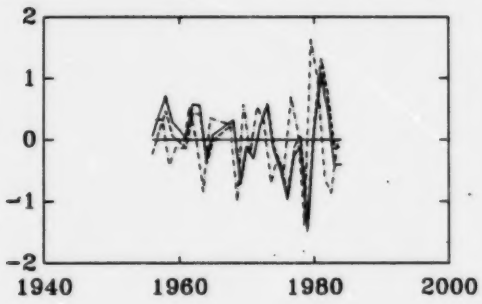
TAU (28.246, 17.311, 6.029)

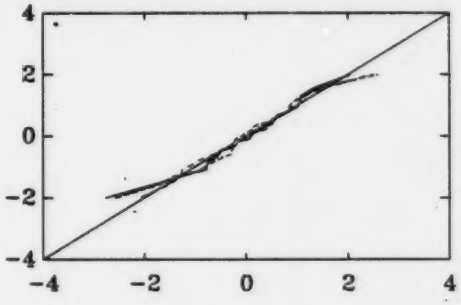
Log Transformed (base 10) Recruitment Data

..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	5.861	50-59
5.805	5.945	6.016	6.077	5.937	5.862	5.825	5.869	5.775	5.405	60-69
5.147	5.137	5.368	5.621	5.535	5.481	5.186	5.206	5.578	5.529	70-79
5.579	5.732	5.691	5.392	5.406	5.537	..	..	..	..	80-89

COD 3M COD3M
START YEAR = 56 END YEAR = 84 NUMBER OF DATA POINTS = 27
SOURCE: 56-65: Anderson, NAFO SRC Doc. 82/62, 67-84: Wells and Baird, NAFO SRC Doc. 85/65.
COMMENTS: 56-65:SPA, 67-84:SPA, RV(2+3).

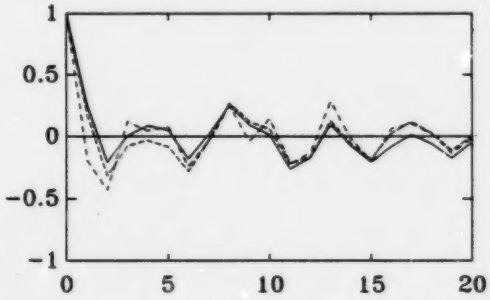
COD3M MEAN = 4.410 SLOPE = -0.023 VAR RATIO = 0.761 N = 27

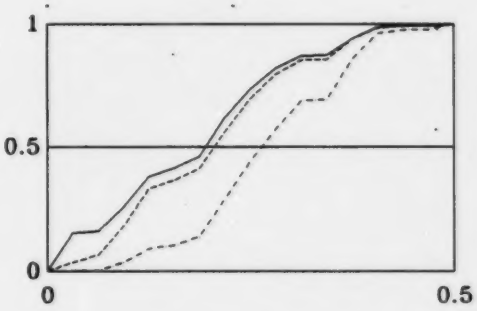




SD (0.538, 0.509, 0.664)

RHO (0.983, 0.976, 0.991)





ACF(1) (0.256, 0.175, -0.195)

TAU (5.121, 4.852, 3.780)

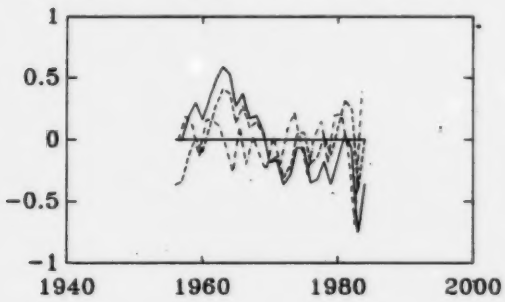
Log Transformed (base 10) Recruitment Data

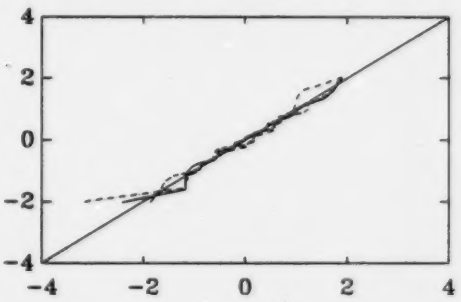
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	4.463	4.797	5.127	4.696	50-59
4.580	4.442	4.989	4.972	4.126	4.484	..	..	4.732	3.731	60-69
4.312	4.095	4.651	4.959	4.244	3.926	3.439	4.146	4.308	2.918	70-79
4.551	5.503	4.867	3.999	4.003	..	..	..	..	..	80-89

COD 3NO COD3NO
START YEAR = 56 END YEAR = 84 NUMBER OF DATA POINTS = 29
SOURCE: Anom. (Baird, Bishop), NAFO SCS Doc. 88/20.

COMMENTS: SPA, 3 year olds in (000's).

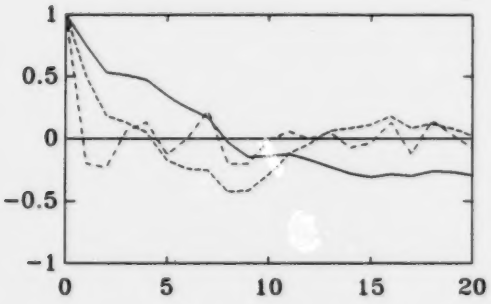
COD3NO MEAN = 4.731 SLOPE = -0.026 VAR RATIO = 0.236 N = 29

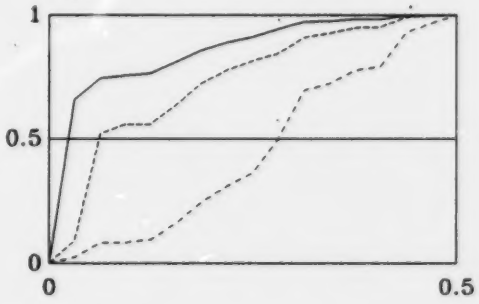




SD (0.310, 0.220, 0.213)

RHO (0.989, 0.991, 0.961)





ACF(1) (0.749, 0.498, -0.199)

TAU (42.081, 16.368, 3.546)

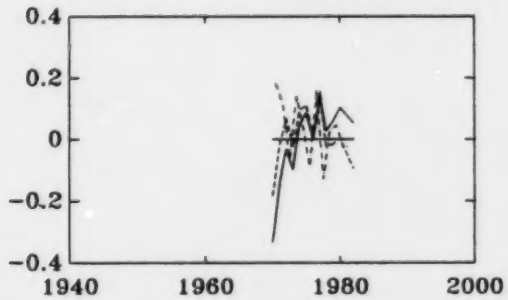
Log Transformed (base 10) Recruitment Data

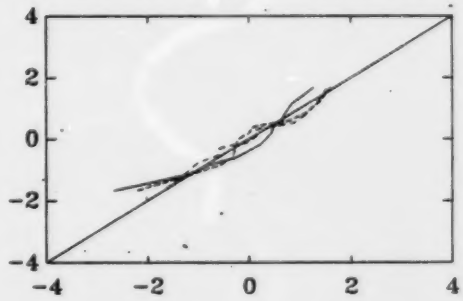
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	4.730	4.726	4.914	5.032	50-59
4.893	5.050	5.211	5.322	5.263	5.002	5.107	4.905	4.927	4.792	60-69
4.546	4.568	4.369	4.447	4.668	4.661	4.383	4.409	4.557	4.368	70-79
4.566	4.767	4.667	3.982	4.372	..	..	..	..	..	80-89

COD 3PnRS COD3PnRS
START YEAR = 70 END YEAR = 82 NUMBER OF DATA POINTS = 13
SOURCE: Frechet, CAFSAC Res. Doc. 88/24.

COMMENTS: SPA, 4 year olds in (000's).

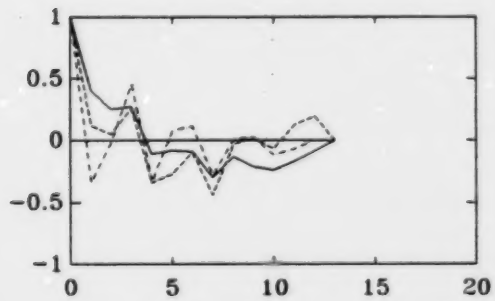
COD3PnRS MEAN = 5.089 SLOPE = 0.025 VAR RATIO = 0.308 N = 13

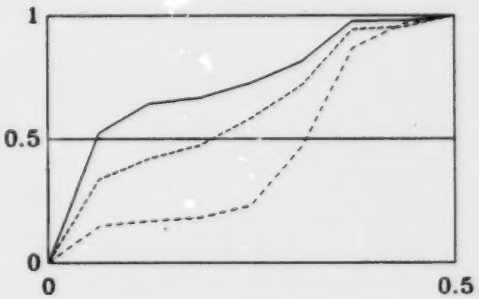




SD (0.125, 0.083, 0.098)

RHO (0.924, 0.970, 0.985)





ACF(1) (0.405, 0.122, -0.341)

TAU (16.762, 4.922, 3.151)

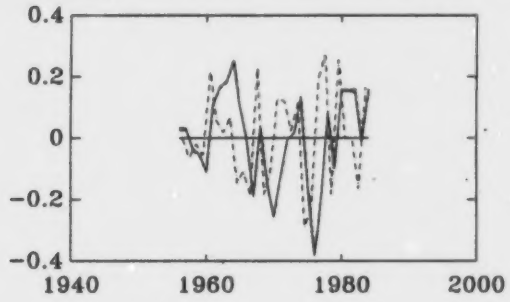
Log Transformed (base 10) Recruitment Data

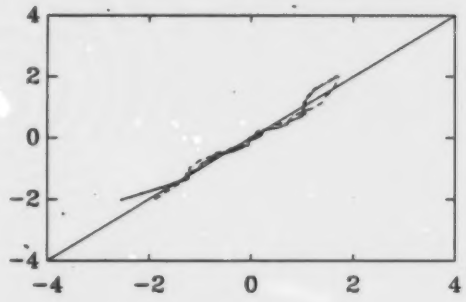
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	..	..	..	..	..	60-69
4.757	4.939	5.058	4.991	5.132	5.178	5.089	5.247	5.118	5.147	70-79
5.195	5.168	5.144	..	..	..	..	..	..	..	80-89

COD 3Ps COD3Ps
START YEAR - 56 END YEAR - 84 NUMBER OF DATA POINTS - 29
SOURCE: Anom. (Baird, Bishop), NAFO SCS Doc. 88/20.

COMMENTS: SPA, 3 year olds in (000's).

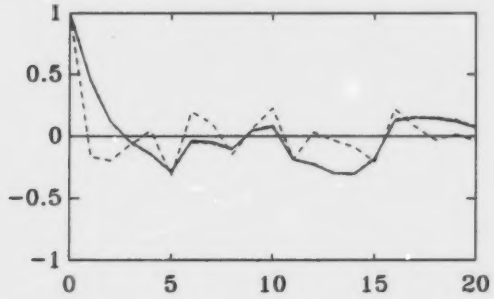
COD3Ps MEAN = 4.740 SLOPE = -0.001 VAR RATIO = 0.543 N = 29

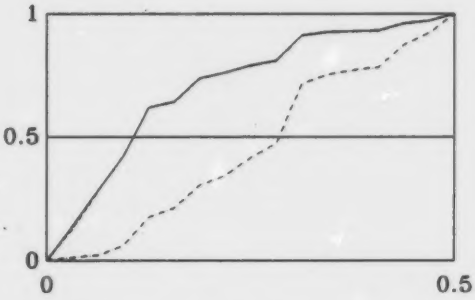




SD (0.149, 0.149, 0.155)

RHO (0.981, 0.981, 0.989)





ACF(1) (0.457, 0.455, -0.160)

TAU (9.415, 9.426, 3.511)

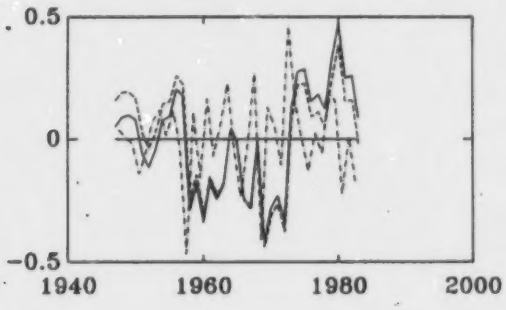
Log Transformed (base 10) Recruitment Data

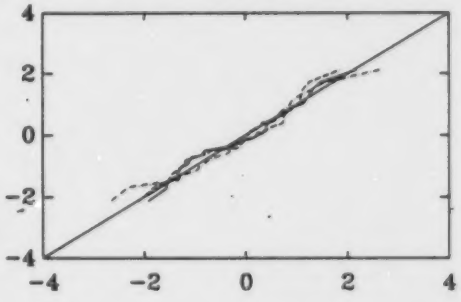
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	4.774	4.773	4.707	4.687	50-59
4.633	4.850	4.908	4.926	4.993	4.846	4.735	4.550	4.778	4.593	60-69
4.483	4.613	4.734	4.757	4.875	4.587	4.359	4.551	4.822	4.639	70-79
4.893	4.893	4.892	4.727	4.891	..	..	..	..	..	80-89

COD 4TVn COD4TVn
START YEAR = 47 END YEAR = 83 NUMBER OF DATA POINTS = 37
SOURCE: Chouinard and Sinclair, CAFSAC Res. Doc. 88/28.

COMMENTS: SPA, 3 year olds in (000's).

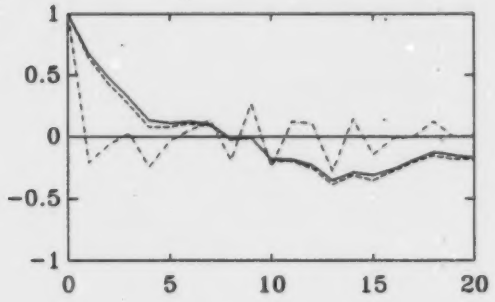
COD4TVn MEAN = 4.952 SLOPE = 0.006 VAR RATIO = 0.330 N = 37

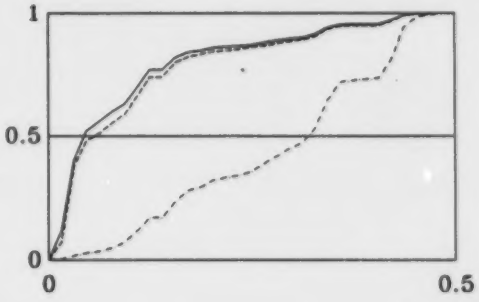




SD (0.217, 0.208, 0.176)

RHO (0.985, 0.974, 0.980)





ACF(1) (0.676, 0.641, -0.210)

TAU (22.645, 17.694, 3.124)

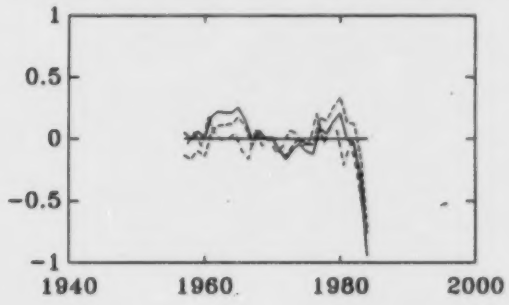
Log Transformed (base 10) Recruitment Data

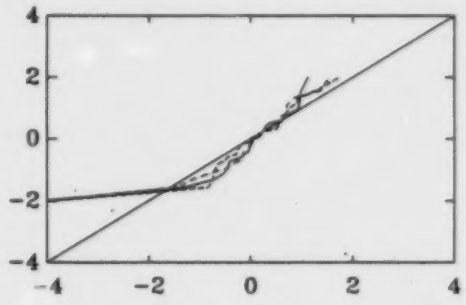
..	..	..	..	..	..	..	5.003	5.039	5.048	40-49
5.030	4.890	4.838	4.910	5.028	5.044	5.156	5.128	4.662	4.770	50-59
4.614	4.777	4.709	4.764	4.990	4.945	4.711	4.679	4.946	4.536	60-69
4.666	4.723	4.617	5.081	5.225	5.237	5.108	5.134	5.078	5.268	70-79
5.424	5.201	5.210	5.041	..	..	..	..	..	..	80-89

COD 4VsW COD4VsW
START YEAR = 57 END YEAR = 84 NUMBER OF DATA POINTS = 28
SOURCE: Sinclair and Smith, CAFSAC Res. Doc. 87/72, updated by Fanning.

COMMENTS: SPA, 1 year olds in (000's).

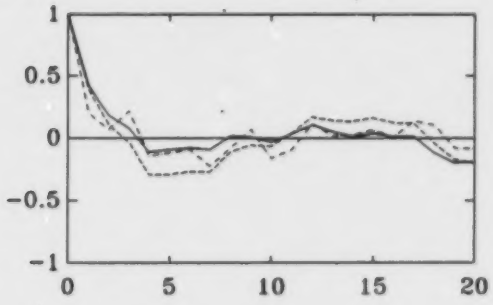
COD4TVsW MEAN = 4.969 SLOPE = -0.014 VAR RATIO = 0.249 N = 28

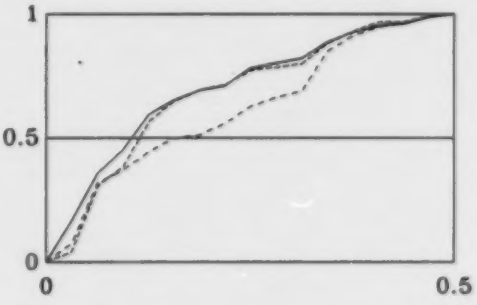




SD (0.223, 0.194, 0.157)

RHO .(0.848, 0.899, 0.892)





ACF(1) (0.425, 0.392, 0.204)

TAU (9.598, 8.764, 6.183)

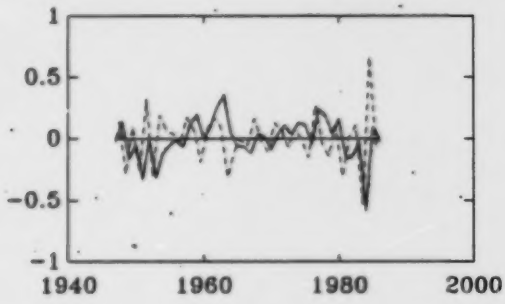
Log Transformed (base 10) Recruitment Data

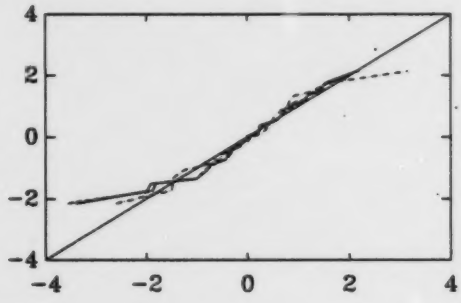
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	5.019	4.977	5.030	50-59
4.969	5.145	5.191	5.182	5.180	5.222	5.126	4.962	5.035	4.974	60-69
4.982	4.872	4.806	4.881	4.927	4.868	4.847	5.052	5.013	5.106	70-79
5.177	4.964	4.933	4.672	4.026	..	..	..	..	..	80-89

COD 4X COD4X
START YEAR - 47 END YEAR - 86 NUMBER OF DATA POINTS - 40
SOURCE: Campana and Simon, CAFSAC 88/26.

COMMENTS: SPA, 1 year olds in (000's).

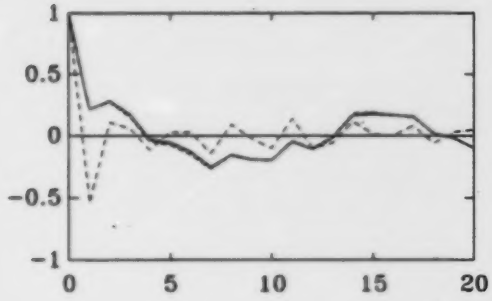
COD4X MEAN = 4.275 SLOPE = 0.001 VAR RATIO = 0.803 N = 40

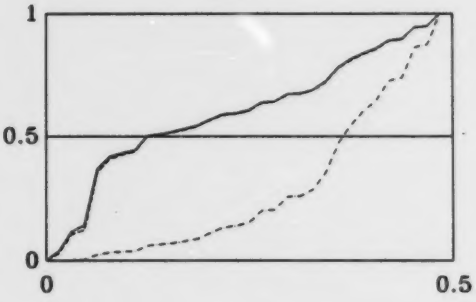




SD (0.165, 0.165, 0.209)

RHO (0.966, 0.961, 0.972) .





ACF(1) (0.217, 0.210, -0.541)

TAU (8.033, 7.899, 2.739)

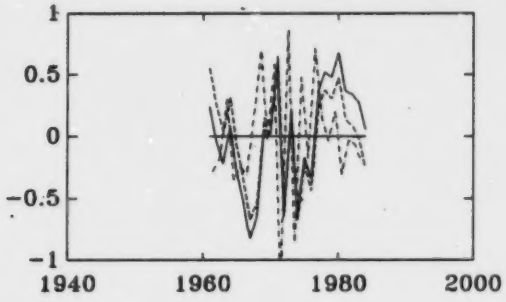
Log Transformed (base 10) Recruitment Data

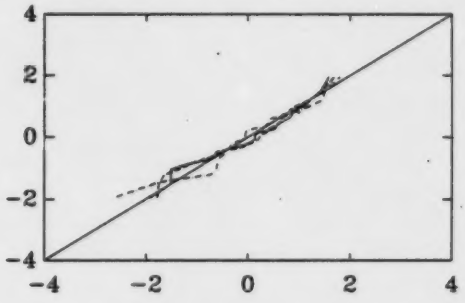
..	..	..	..	..	..	..	4.254	4.395	4.110	40-49
4.208	3.946	4.268	3.960	4.151	4.218	4.261	4.205	4.381	4.463	50-59
4.275	4.356	4.527	4.631	4.318	4.214	4.209	4.154	4.316	4.292	60-69
4.186	4.316	4.385	4.312	4.406	4.391	4.241	4.513	4.469	4.328	70-79
4.437	4.129	4.144	4.255	3.711	4.374	4.275	..	..	..	80-89

COD 5Y COD5Y
START YEAR = 61 END YEAR = 84 NUMBER OF DATA POINTS = 24
SOURCE: Woods Hole Ref. Doc. 86-12.

COMMENTS: RV(0+1).

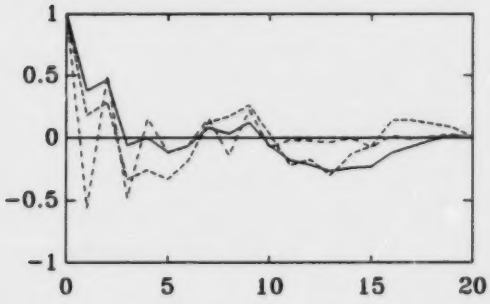
COD5Y MEAN = 0.122 SLOPE = 0.027 VAR RATIO = 0.642 N = 24

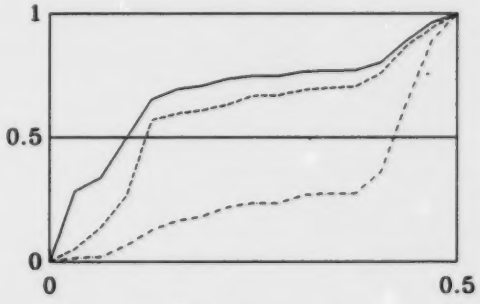




SD (0.427, 0.384, 0.484)

RHO (0.983, 0.981, 0.972)





ACF(1) (0.377, 0.180, −0.566)

TAU (10.586, 8.476, 2.370)

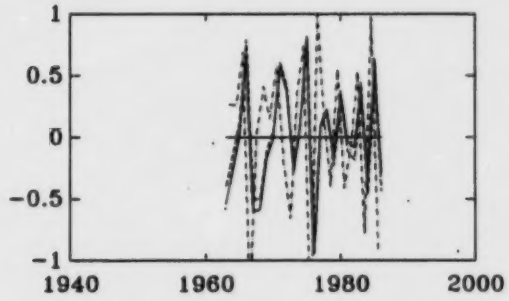
Log Transformed (base 10) Recruitment Data

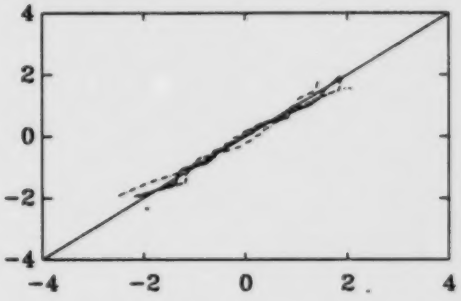
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	0.362	0.079	-0.097	0.204	-0.155	-0.398	-0.699	-0.523	0.176	60-69
0.146	0.732	-0.523	0.342	-0.523	-0.046	-0.222	0.491	0.643	0.602	70-79
0.799	0.491	0.462	0.398	0.176	..	..	..	..	..	80-89

COD 5Ze COD5Ze
START YEAR - 63 END YEAR - 87 NUMBER OF DATA POINTS - 24
SOURCE: Hunt, CAFSAC Res. Doc. 88/73.

COMMENTS: RV(0+1), index * 1000.

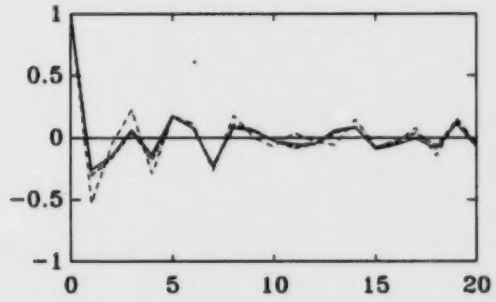
COD5Ze MEAN = 2.784 SLOPE = 0.013 VAR RATIO = 1.270 N = 24

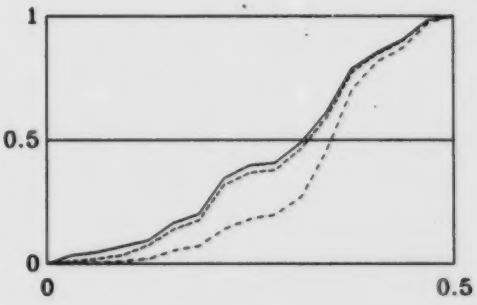




SD (0.442, 0.433, 0.704)

RHO (0.992, 0.991, 0.974)





ACF(1) (-0.258, -0.307, -0.527)

TAU (3.173, 3.109, 2.863)

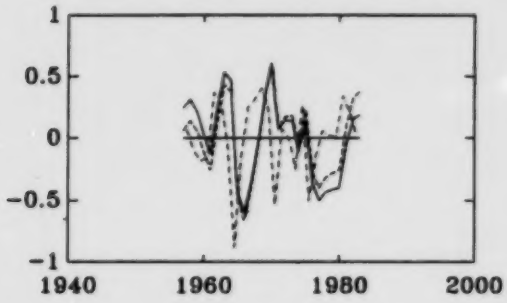
Log Transformed (base 10) Recruitment Data

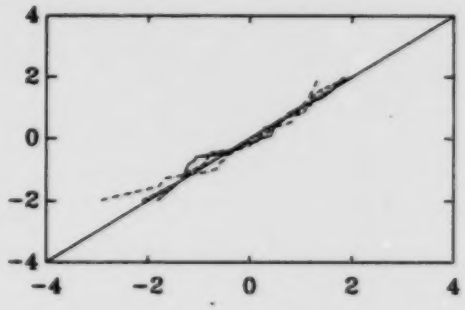
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	2.243	2.512	2.774	3.467	2.182	2.198	2.611	60-69
2.767	3.348	3.155	2.497	2.864	3.603	1.862	2.888	3.012	2.613	70-79
3.164	2.751	2.696	3.230	2.447	3.424	2.496	..	..	..	80-89

COD NORTH-EAST ARCTIC CODNEAR
START YEAR - 57 END YEAR - 83 NUMBER OF DATA POINTS - 27
SOURCE: Report of the Arctic Fisheries Working Group, ICES C.M. 1988.

COMMENTS: SPA, 3 year olds in (000's).

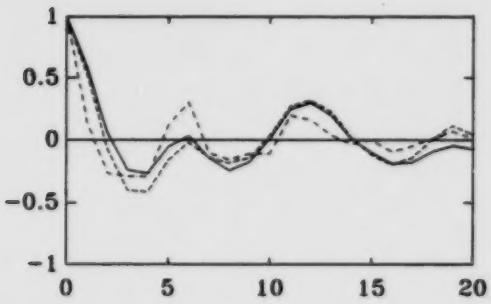
CODNEAR MEAN = 5.652 SLOPE = -0.014 VAR RATIO = 0.414 N = 27

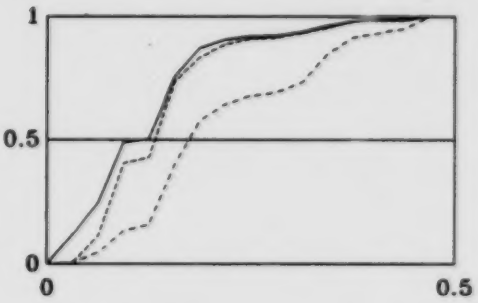




SD (0.332, 0.312, 0.302)

RHO (0.982, 0.990, 0.957)





ACF(1) (0.586, 0.522, 0.136)

TAU (8.552, 7.562, 5.748)

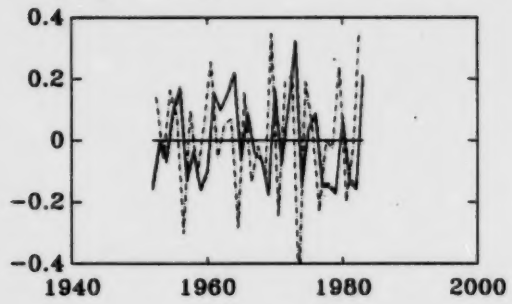
Log Transformed (base 10) Recruitment Data

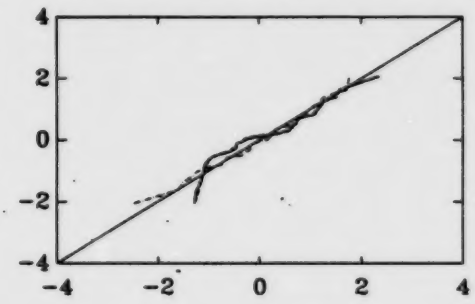
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	5.898	5.963	5.863	50-59
5.676	5.524	5.891	6.184	6.112	5.230	5.049	5.295	5.607	6.005	60-69
6.260	5.720	5.794	5.788	5.535	5.806	5.300	5.152	5.215	5.239	70-79
5.252	5.594	5.804	5.839	..	..	..	..	..	..	80-89

COD ICELAND CODICE
START YEAR - 52 END YEAR - 83 NUMBER OF DATA POINTS - 32
SOURCE: Marine Research Institute, Iceland, Mon Jun 20/1988.

COMMENTS: SPA, 3 year olds in actual numbers.

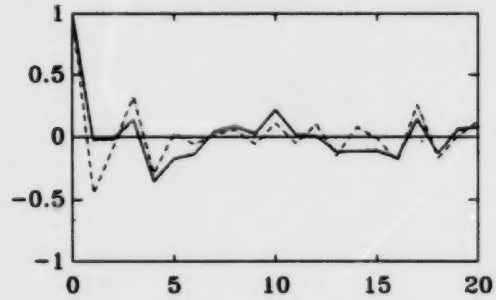
CODICE MEAN = 8.310 SLOPE = -0.001 VAR RATIO = 0.992 N = 32

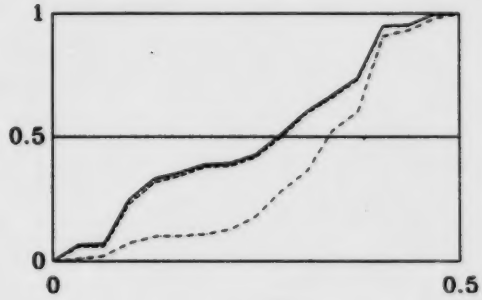




SD (0.139, 0.139, 0.196)

RHO (0.965, 0.962, 0.991)





ACF(1) (-0.012, -0.025, -0.450)

TAU (3.599, 3.544, 2.948)

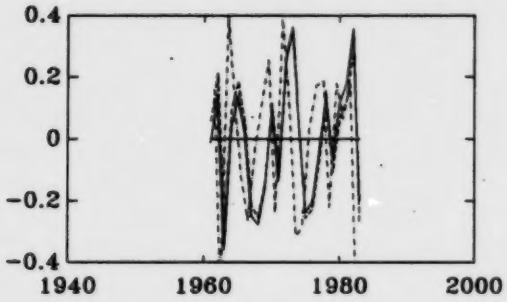
Log Transformed (base 10) Recruitment Data

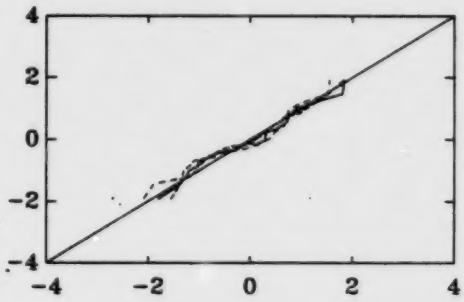
..	..	..	..	..	..	..	..	..	..	40-49
..	..	8.165	8.305	8.249	8.413	8.484	8.181	8.277	8.151	50-59
8.211	8.467	8.412	8.463	8.532	8.247	8.402	8.267	8.248	8.132	60-69
8.478	8.229	8.420	8.632	8.157	8.348	8.390	8.159	8.159	8.135	70-79
8.376	8.176	8.151	8.508	..	..	..	..	..	..	80-89

COD FAROE PLATEAU CODFAPL
START YEAR = 61 END YEAR = 83 NUMBER OF DATA POINTS = 23
SOURCE: Report of the North-Western Working Group,ICES C.M. 1987.

COMMENTS: SPA, 1 year olds in actual numbers.

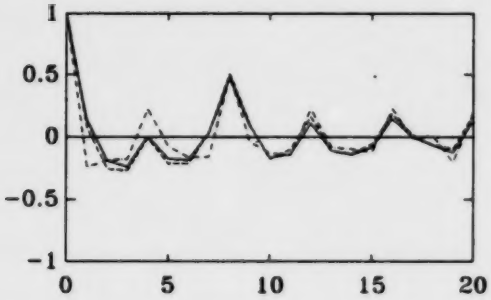
CODFAPL MEAN = 7.327 SLOPE = 0.006 VAR RATIO = 0.876 N = 23

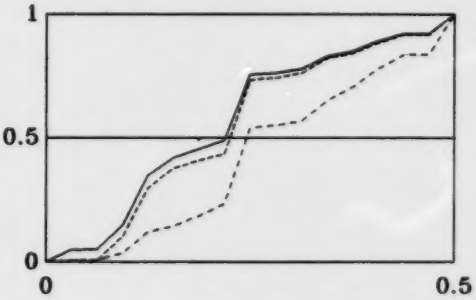




SD (0.198, 0.193, 0.262)

RHO (0.990, 0.979, 0.972)





ACF(1) (0.140, 0.076, -0.244)

TAU (4.544, 4.430, 4.063)

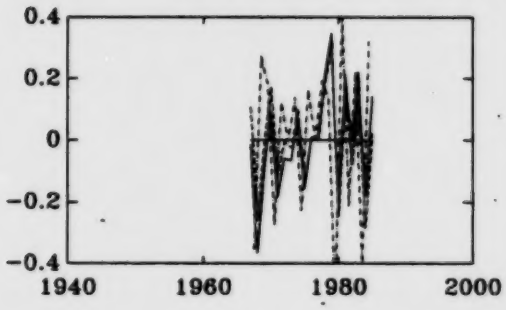
Log Transformed (base 10) Recruitment Data

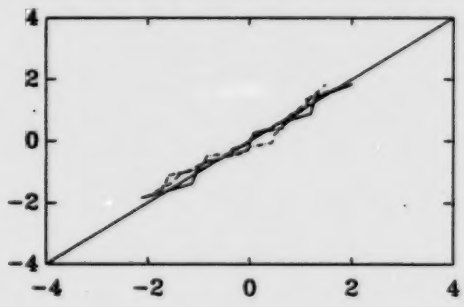
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	7.314	7.474	6.969	7.365	7.468	7.344	7.079	7.049	7.173	60-69
7.430	7.190	7.579	7.689	7.373	7.089	7.124	7.295	7.484	7.261	70-79
7.442	7.507	7.684	7.129	..	..	..	..	..	..	80-89

COD VIa CODVIa
START YEAR - 67 END YEAR - 85 NUMBER OF DATA POINTS - 19
SOURCE: Report of the North Sea Roundfish Working Group, ICES C.M. 1988.

COMMENTS: SPA, 1 year olds in (000's).

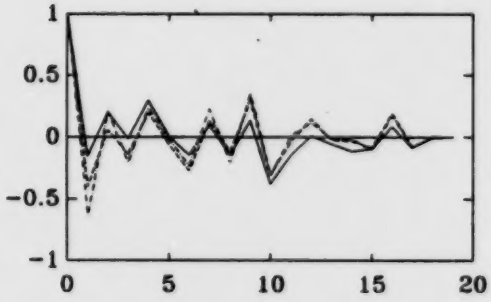
CODVIa MEAN = 3.969 SLOPE = 0.013 VAR RATIO = 1.197 N = 19

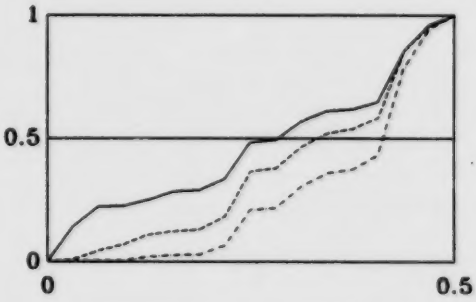




SD (0.173, 0.156, 0.268)

RHO (0.991, 0.985, 0.966)





ACF(1) (-0.154, -0.400, -0.635)

TAU (3.527, 3.004, 2.428)

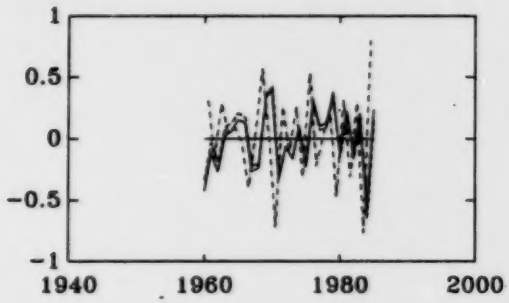
Log Transformed (base 10) Recruitment Data

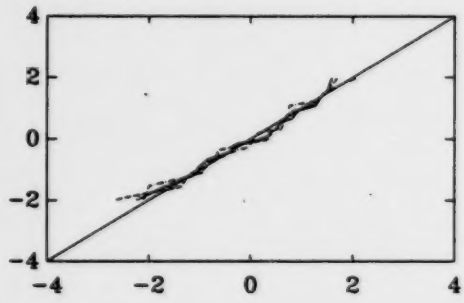
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	..	..	3.954	3.602	3.875	60-69
4.061	3.785	3.908	3.903	4.041	3.813	3.978	3.981	4.176	4.314	70-79
3.775	4.181	3.967	4.190	3.791	4.111	..	..	..	..	80-89

COD NORTH SEA CODNS
START YEAR - 60 END YEAR - 85 NUMBER OF DATA POINTS - 26
SOURCE: Report of the North Sea Roundfish Working Group. ICES C.M. 1988.

COMMENTS: SPA, 1 year olds in (000's).

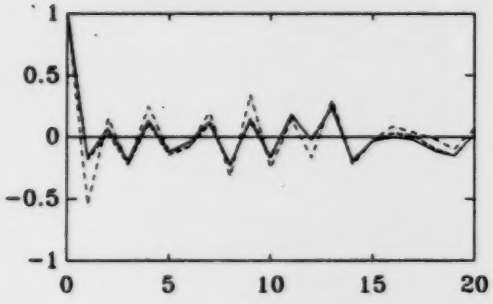
CODNS MEAN = 5.528 SLOPE = 0.007 VAR RATIO = 1.131 N = 26

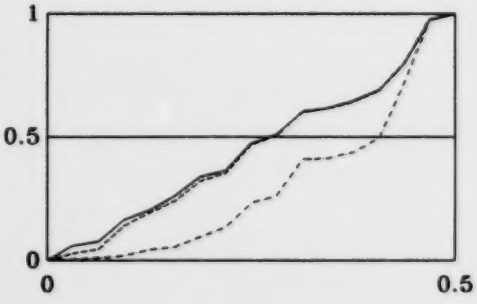




SD (0.251, 0.245, 0.378)

RHO (0.989, 0.980, 0.988)





ACF(1) (-0.164, -0.185, -0.549)

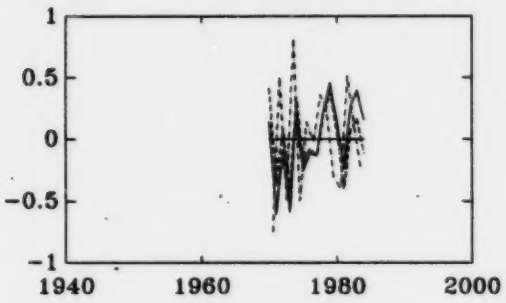
TAU (3.671, 3.602, 2.457)

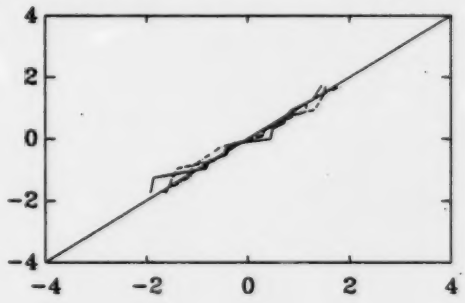
Log Transformed (base 10) Recruitment Data

..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
5.107	5.418	5.263	5.549	5.594	5.680	5.664	5.267	5.295	5.861	60-69
5.928	5.204	5.467	5.369	5.629	5.316	5.851	5.631	5.658	5.903	70-79
5.435	5.748	5.438	5.732	4.966	5.764	..	..	..	..	80-89

COD CELTIC SEA (VIIf & VIIg) CODCS
START YEAR = 70 END YEAR = 84 NUMBER OF DATA POINTS = 15
SOURCE: Report of the Irish Sea and Bristol Channel Working Group, ICES C.M. 1987.
COMMENTS: SPA, 1 year olds in actual numbers.

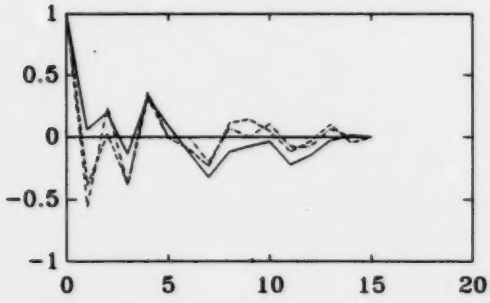
CODCS MEAN = 6.267 SLOPE = 0.039 VAR RATIO = 0.993 N = 15

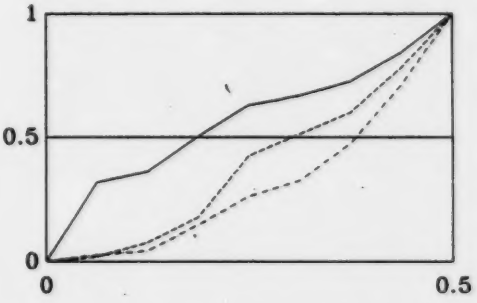




SD (0.317, 0.269, 0.446)

RHO (0.970, 0.984, 0.989)





ACF(1) (0.058, −0.385, −0.560)

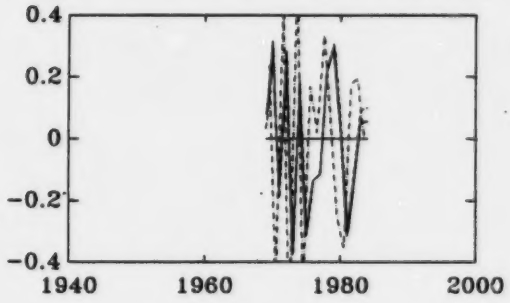
TAU (5.356, 3.293, 2.619)

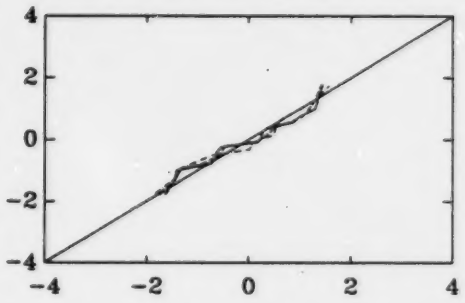
Log Transformed (base 10) Recruitment Data

..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	..	..	..	..	..	60-69
6.410	5.660	6.169	5.677	6.502	6.008	6.151	6.133	6.495	6.728	70-79
6.417	6.023	6.539	6.666	6.422	..	..	..	..	..	80-89

COD IRISH SEA (VIIa) CODIS
START YEAR - 69 END YEAR - 84 NUMBER OF DATA POINTS - 16
SOURCE: Report of the Irish Sea and Bristol Channel Working Group, ICES C.M. 1987.
COMMENTS: SPA, 1 year olds in actual numbers.

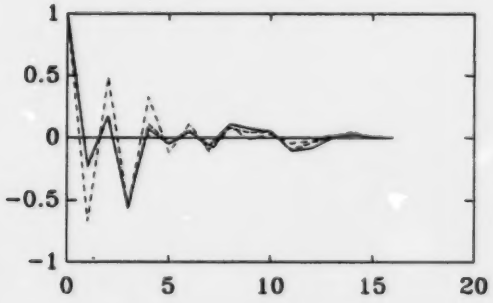
CODIS MEAN = 6.780 SLOPE = -0.006 VAR RATIO = 1.290 N = 16

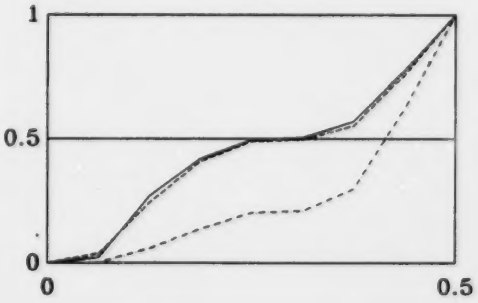




SD (0.217, 0.216,. 0.349)

RHO (0.975, 0.979, 0.977)





ACF(1) (-0.215, -0.236, -0.672)

TAU (3.655, 3.158, 2.414)

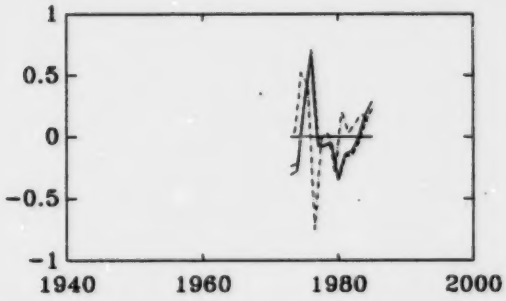
Log Transformed (base 10) Recruitment Data

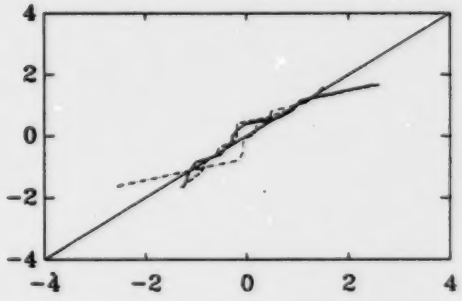
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	..	..	..	..	6.858	60-69
7.095	6.620	7.061	6.425	6.970	6.473	6.644	6.663	6.996	7.070	70-79
6.819	6.466	6.641	6.834	6.836	..	..	..	..	..	80-89

COD VIIde CODVIIde
START YEAR - 73 END YEAR - 85 NUMBER OF DATA POINTS - 13
SOURCE: Report of the North Sea Roundfish Working Group, ICES C.M. 1988.

COMMENTS: SPA, 1 year olds in (000's).

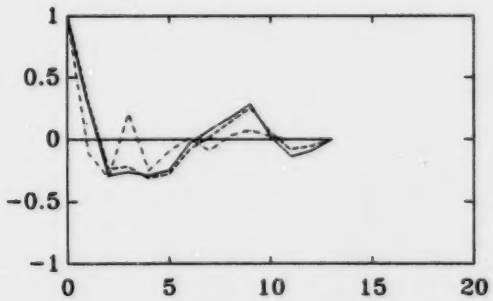
CODVIIde MEAN = 3.820 SLOPE = 0.011 VAR RATIO = 0.660 N = 13

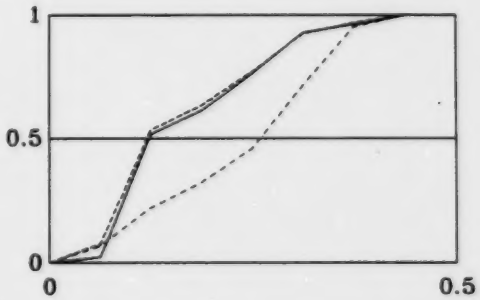




SD (0.273, 0.269, 0.313)

RHO (0.950, 0.932, 0.928)





ACF(1) (0.284, 0.310, -0.103)

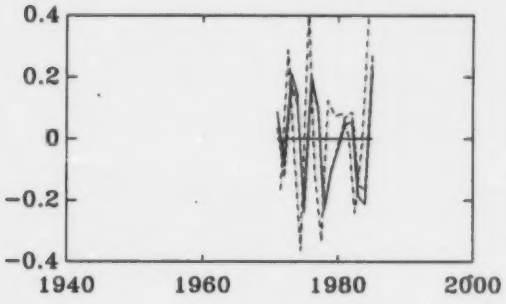
TAU (8.139, 8.304, 3.838)

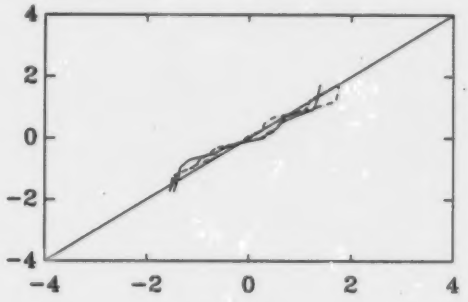
Log Transformed (base 10) Recruitment Data

..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	..	..	..	..	..	60-69
..	..	..	3.512	3.544	4.070	4.495	3.744	3.742	3.770	70-79
3.480	3.681	3.707	3.812	4.000	4.108	..	..	..	..	80-89

COD KATTEGAT CODKAT
START YEAR - 71 END YEAR - 85 NUMBER OF DATA POINTS - 15
SOURCE: Report of the Division IIIa Demersal Stocks Working Groups, ICES C.M.1987.
COMMENTS: SPA, 1 year olds in (000's).

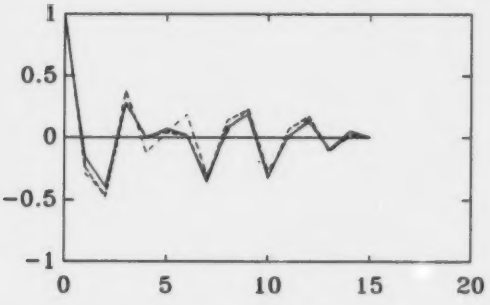
CODKAT MEAN = 4.268 SLOPE = -0.008 VAR RATIO = 1.157 N = 15

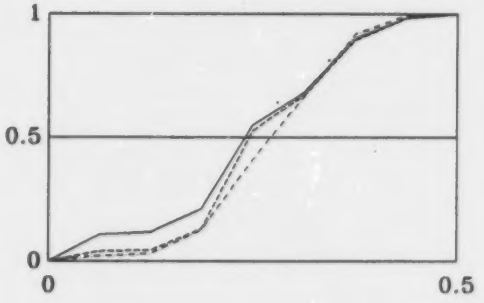




SD (0.159, 0.156, 0.242)

RHO (0.968, 0.983, 0.985)





ACF(1) (-0.155, -0.238, -0.288)

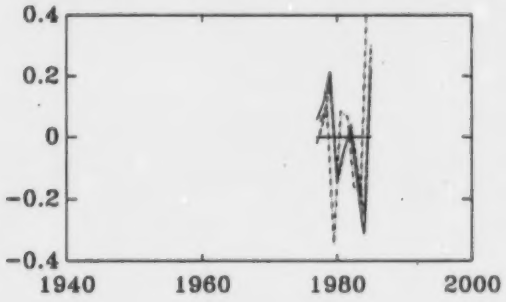
TAU (4.147, 4.068, 3.678)

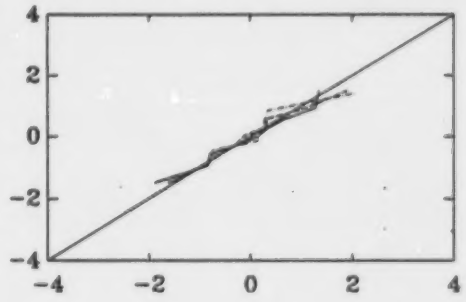
Log Transformed (base 10) Recruitment Data

..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	..	..	..	..	..	60-69
..	4.357	4.191	4.480	4.414	4.050	4.470	4.370	4.035	4.159	70-79
4.234	4.315	4.325	4.082	4.055	4.489	..	..	..	..	80-89

COD SKAGERRAK CODSKAG
START YEAR = 77 END YEAR = 85 NUMBER OF DATA POINTS = 9
SOURCE: Report of the Division IIIa Demersal Stocks Working Groups, ICES C.M.1987.
COMMENTS: SPA, 1 year olds in actual numbers.

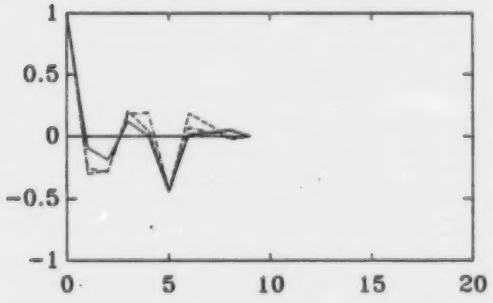
CODSKAG MEAN = 7.278 SLOPE = -0.019 VAR RATIO = 1.101 N = 9

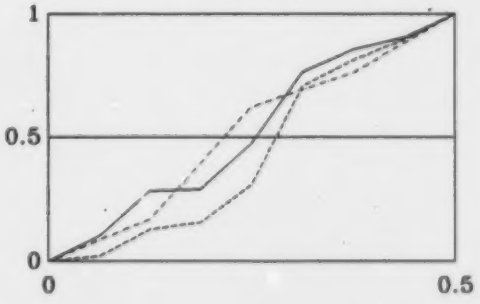




SD (0.166, 0.158, 0.246)

RHO (0.983, 0.990, 0.945)





ACF(1) (-0.093, -0.305, -0.253)

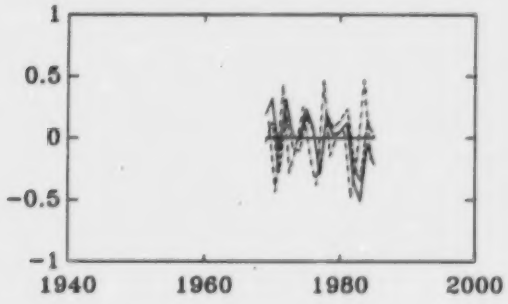
TAU (3.906, 3.568, 4.614)

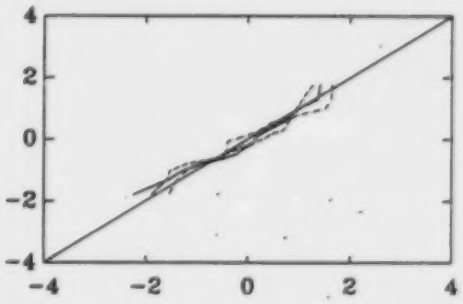
Log Transformed (base 10) Recruitment Data

..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	..	..	..	..	..	60-69
..	..	..	..	..	..	..	7.336	7.389	7.492	70-79
7.147	7.233	7.301	7.141	6.966	7.501	..	..	..	..	80-89

COD BALTIC AREAS 22&24 CODBA2224
START YEAR = 69 END YEAR = 85 NUMBER OF DATA POINTS = 17
SOURCE: Report of the Working Group on Assessment of Demersal Stocks in the Baltic ICES C.M. 1988.
COMMENTS: SPA, 1 year olds in (000's).

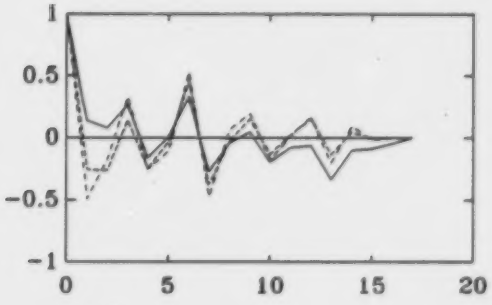
CODBA2224 MEAN = 4.838 SLOPE = -0.028 VAR RATIO = 0.859 N = 17

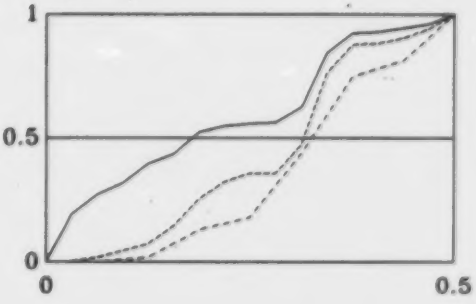




SD (0.230, 0.185, 0.301)

RHO (0.979, 0.960, 0.978)





ACF(1) (0.140, -0.251, -0.494)

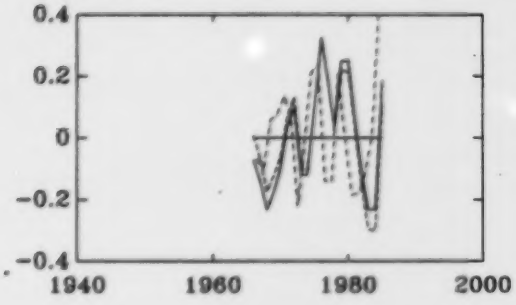
TAU (5.586, 3.173, 3.078)

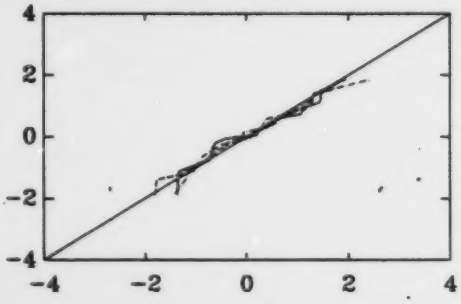
Log Transformed (base 10) Recruitment Data

..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	..	..	..	..	5.028	60-69
5.161	4.724	5.155	4.869	4.820	5.072	4.924	4.544	5.009	4.862	70-79
4.892	4.964	4.477	4.322	4.792	4.623	..	..	..	..	80-89

COD BALTIC AREAS 25-32 CODBA2532
START YEAR - 66 END YEAR - 85 NUMBER OF DATA POINTS - 20
SOURCE: Report of the Working Group on Assessment of Demersal Stocks in the Baltic ICES C.M. 1988.
COMMENTS: SPA, 1 year olds in (000's).

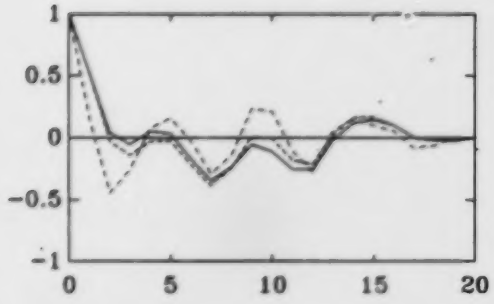
CODBA2532 MEAN = 5.649 SLOPE = 0.008 VAR RATIO = 0.466 N = 20

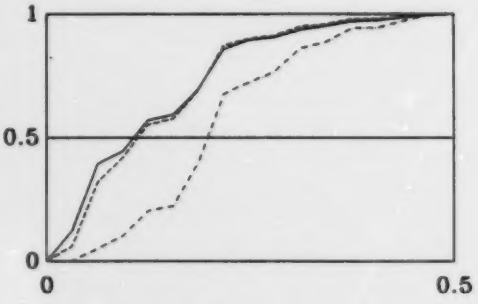




SD (0.172, 0.166, 0.167)

RHO (0.974, 0.993, 0.976)





ACF(1) (0.521, 0.510, 0.138)

TAU (9.297, 8.865, 5.025)

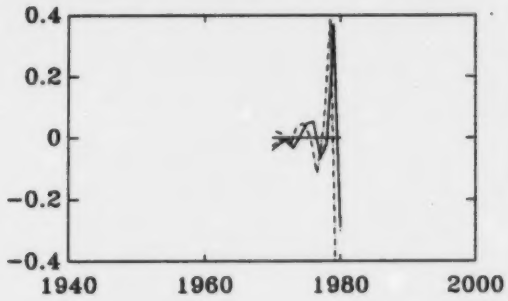
Log Transformed (base 10) Recruitment Data

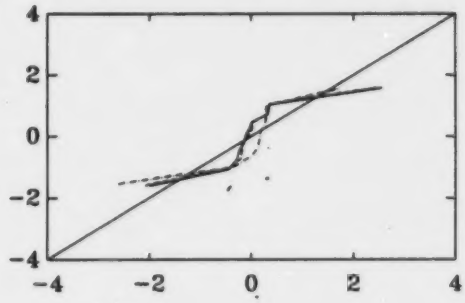
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	..	5.580	5.512	5.415	5.473	60-69
5.546	5.683	5.752	5.531	5.529	5.740	5.976	5.837	5.692	5.896	70-79
5.900	5.714	5.535	5.417	5.420	5.835	..	..	..	..	80-89

GREENLAND HALIBUT V&XIV GHALV&XIV
START YEAR - 70 END YEAR - 80 NUMBER OF DATA POINTS - 11
SOURCE: Report of the North-Western Working Group, ICES C.M. 1987.

COMMENTS: SPA, 5 year olds in actual numbers.

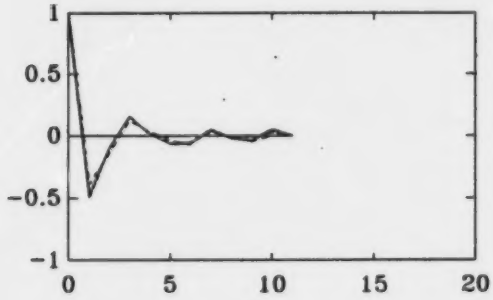
GHALV&XIV MEAN = 7.429 SLOPE = 0.003 VAR RATIO = 1.412 N = 11

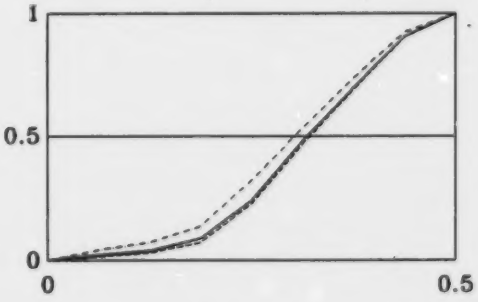




SD (0.146, 0.146, 0.245)

RHO (0.871, 0.873, 0.844)





ACF(1) (−0.480, −0.502, −0.390)

TAU (3.148, 3.113, 3.303)

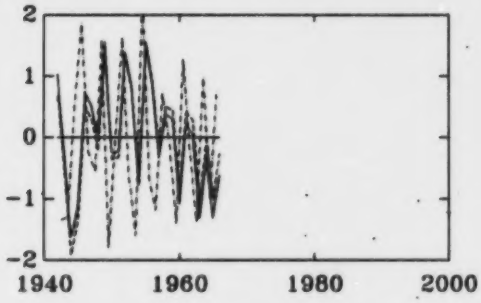
Log Transformed (base 10) Recruitment Data

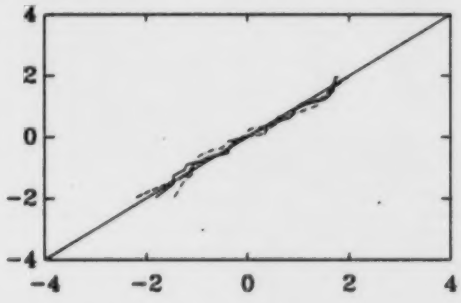
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	..	..	..	..	..	60-69
7.389	7.409	7.422	7.393	7.430	7.476	7.482	7.366	7.412	7.799	70-79
7.140	..	..	..	..	..	..	..	..	..	80-89

HADDOCK 3N01 (First part of HAD3NO) HAD3N01
START YEAR - 42 END YEAR - 66 NUMBER OF DATA POINTS - 25
SOURCE: Templeman et al., ICNAF Res. Bull. 13, 1978.

COMMENTS: RV(5+7).

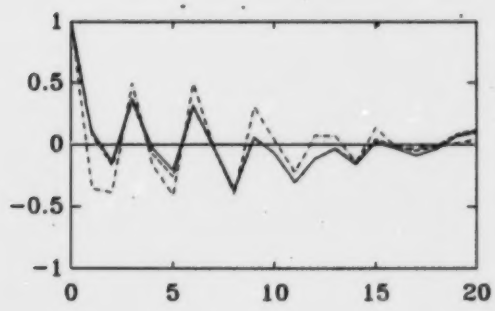
HAD3N01 MEAN = 1.317 SLOPE = -0.030 VAR RATIO = 0.888 N = 25

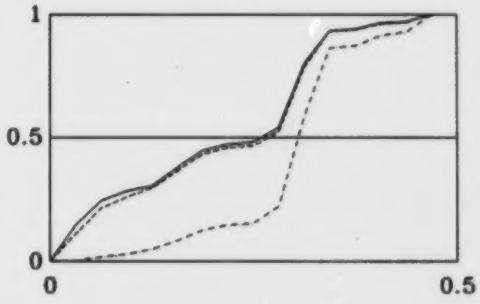




SD (0.898, 0.873, 1.197)

RHO (0.991, 0.993, 0.977)





ACF(1) (0.109, 0.082, -0.352)

TAU (3.849, 3.726, 3.280)

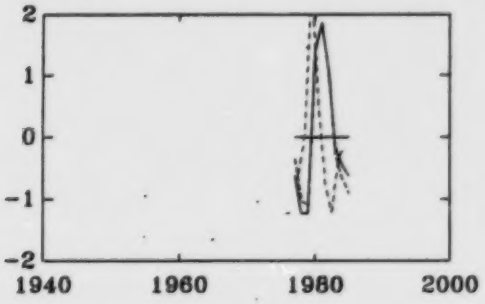
Log Transformed (base 10) Recruitment Data

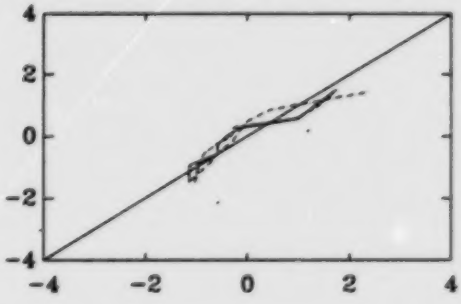
..	..	2.346	1.000	-0.301	0.204	2.064	1.833	1.279	2.874	40-49
1.079	1.079	2.710	2.134	0.531	2.836	2.161	0.978	1.699	1.624	50-59
0.230	1.505	1.380	0.000	0.978	0.000	0.699	..	..	..	60-69
..	..	..	..	..	..	..	..	..	..	70-79
..	..	..	..	..	..	..	..	..	..	80-89

HADDOCK 3NO2 (Second part of HAD3NO) HAD3NO2
START YEAR = 77 END YEAR = 85 NUMBER OF DATA POINTS = 9
SOURCE: Bishop, Baird, Hicks, CAFSAC Res. Doc. 87/48.

COMMENTS: RV(1+2) index * 1000.

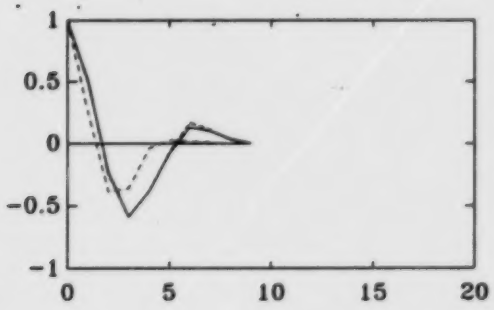
HAD3NO2 MEAN = 2.228 SLOPE = 0.070 VAR RATIO = 0.513 N = 9

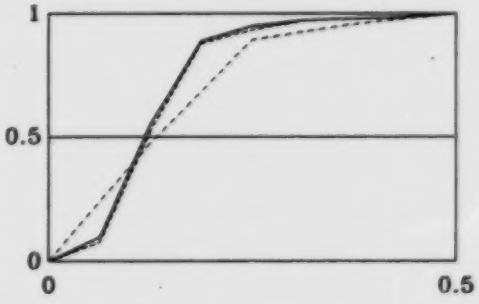




SD (1.081, 1.066, 1.095)

RHO (0.948, 0.932, 0.901)





ACF(1) (0.506, 0.483, 0.236)

TAU (8.487, 8.255, 7.557)

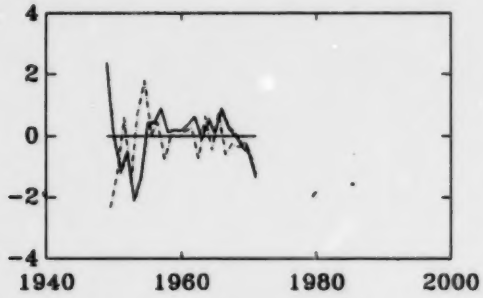
Log Transformed (base 10) Recruitment Data

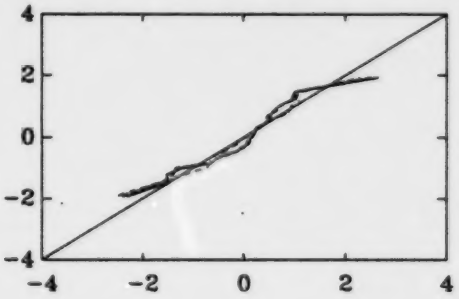
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	..	..	..	..	..	60-69
..	..	..	..	..	..	..	1.602	1.000	1.000	70-79
3.602	4.087	3.301	2.079	1.778	1.602	..	..	..	..	80-89

HADDOCK 3Ps1 (First part of HAD3Ps) HAD3Ps1
START YEAR = 49 END YEAR = 71 NUMBER OF DATA POINTS = 23
SOURCE: Templeman et al., ICNAF Res. Bull. 14, 1979.

COMMENTS: RV(2-4).

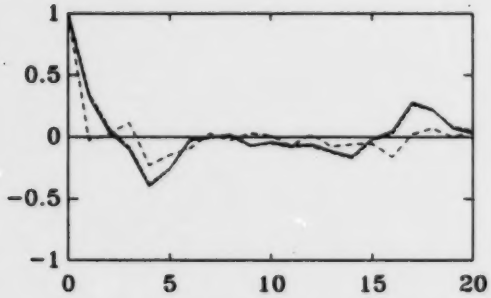
HAD3Ps1 MEAN = 1.063 SLOPE = -0.011 VAR RATIO = 0.469 N = 23

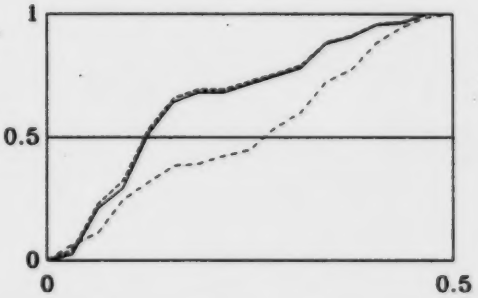




SD (0.896, 0.893, 0.867)

RHO (0.961, 0.962, 0.982)





ACF(1) (0.332, 0.353, -0.032)

TAU (8.129, 8.307, 3.728)

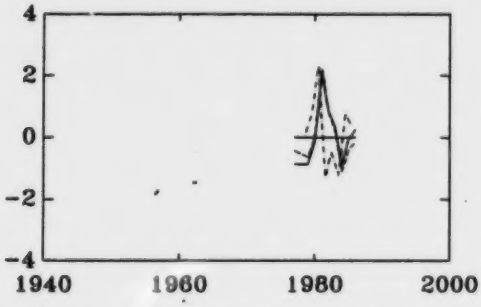
Log Transformed (base 10) Recruitment Data

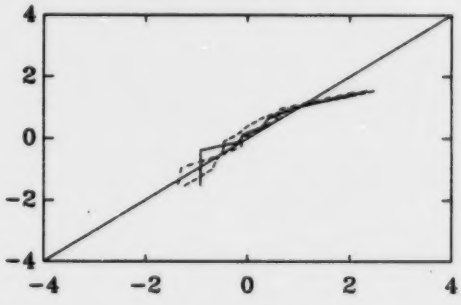
..	..	..	..	..	..	..	..	..	3.435	40-49
1.107	-0.046	0.568	-1.000	-0.301	1.511	1.533	1.968	1.217	1.268	50-59
1.258	1.430	1.690	0.949	1.589	1.130	1.899	1.297	1.068	0.699	60-69
0.491	-0.301	..	..	..	..	..	..	..	..	70-79
..	..	..	..	..	..	..	..	..	..	80-89

HADDOCK 3Ps2 (Second part of HAD3Ps) HAD3Ps2
START YEAR = 77 END YEAR = 86 NUMBER OF DATA POINTS = 10
SOURCE: Bishop, Baird, Hicks, CAFSAC Res. Doc. 87/48.

COMMENTS: RV(1+2) index*1000.

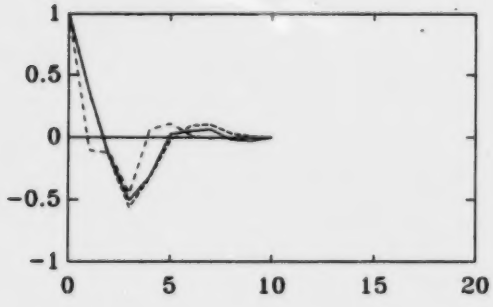
HAD3Ps2 MEAN = 1.855 SLOPE = 0.096 VAR RATIO = 0.642 N = 10

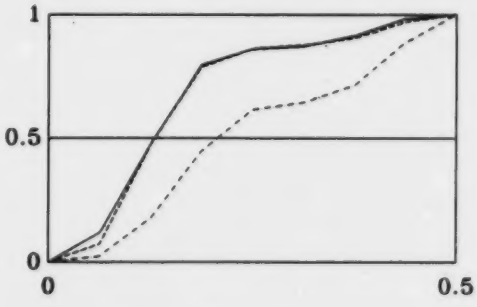




SD (0.925, 0.884, 1.048)

RHO (0.922, 0.914, 0.967)





ACF(1) (0.368, 0.353, -0.102)

TAU (7.689, 7.669, 4.821)

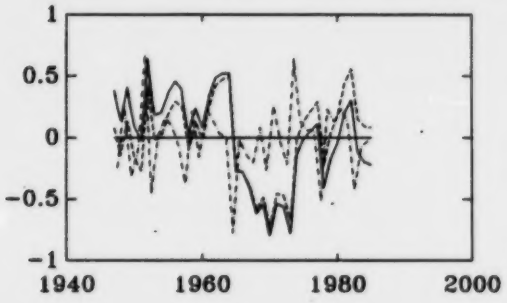
Log Transformed (base 10) Recruitment Data

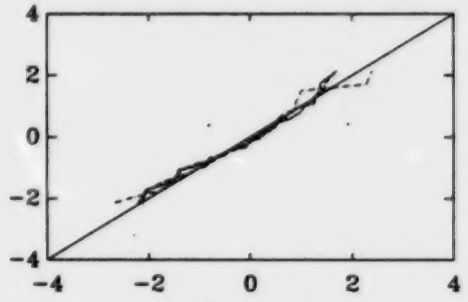
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	..	..	..	..	..	60-69
..	..	..	..	..	..	..	1.000	1.000	1.000	70-79
1.699	4.016	2.708	2.230	1.000	1.778	2.114	..	..	..	80-89

HADDOCK 4TVW HAD4TVW
START YEAR = 47 END YEAR = 85 NUMBER OF DATA POINTS = 39
SOURCE: Zwanenburg and Fanning, CAFSAC Res. Doc. 88/76.

COMMENTS: SPA, 1 year olds in (000's).

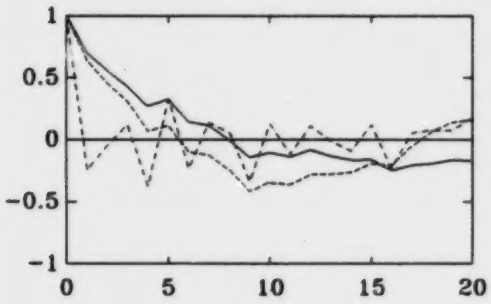
HAD4TVW MEAN = 4.443 SLOPE = -0.016 VAR RATIO = 0.287 N = 39

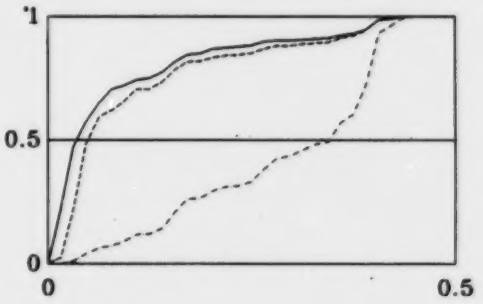




SD (0.378, 0.332, 0.287)

RHO (0.986, 0.986, 0.982)





ACF(1) (0.702, 0.636, -0.249)

TAU (28.091, 20.309, 2.894)

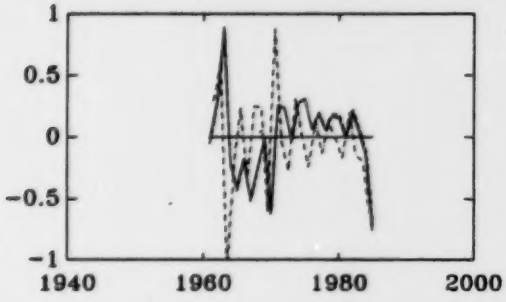
Log Transformed (base 10) Recruitment Data

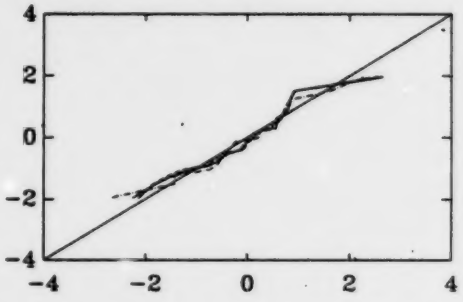
..	..	..	..	...	..	..	4.826	4.583	4.850	40-49
4.533	4.414	5.085	4.629	4.644	4.808	4.900	4.840	4.467	4.683	50-59
4.524	4.768	4.927	4.963	4.962	4.183	4.168	4.032	3.823	3.907	60-69
3.643	3.907	3.880	3.660	4.300	4.434	4.492	4.555	4.036	4.266	70-79
4.396	4.636	4.745	4.323	4.248	4.221	..	..	..	..	80-89

HADDOCK 4X HAD4X
START YEAR - 61 END YEAR - 85 NUMBER OF DATA POINTS - 25
SOURCE: O'Boyle, Simon, Frank, CAFSAC Res. Doc. 88/72.

COMMENTS: SPA, 1 year olds in (000's).

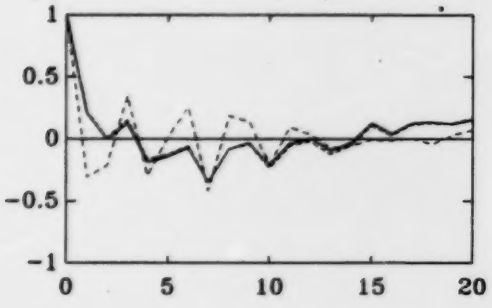
HAD4X MEAN = 4.411 SLOPE = -0.004 VAR RATIO = 0.715 N = 25

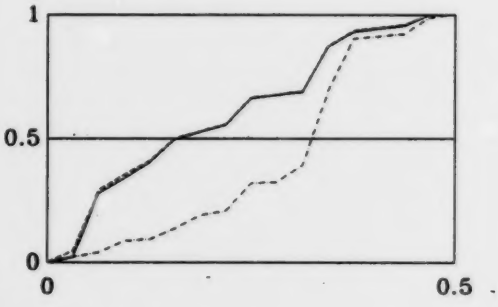




SD (0.337, 0.336, 0.403)

RHO (0.966, 0.967, 0.976)





ACF(1) (0.209, 0.215, -0.307)

TAU (6.326, 6.381, 3.088)

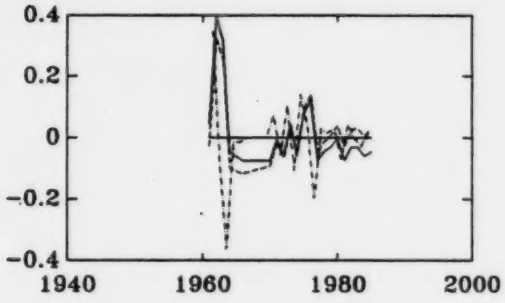
Log Transformed (base 10) Recruitment Data

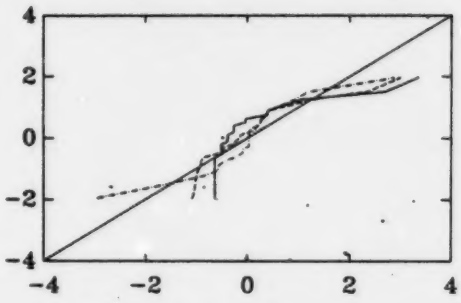
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	4.398	4.692	5.303	4.208	4.003	4.240	3.907	4.160	4.402	60-69
3.795	4.675	4.646	4.375	4.688	4.716	4.471	4.601	4.469	4.576	70-79
4.570	4.399	4.602	4.453	4.261	3.652	..	..	..	..	80-89

HADDOCK 5Y HAD5Y
START YEAR = 61 END YEAR = 85 NUMBER OF DATA POINTS = 25
SOURCE: Woods Hole Ref. Doc. 86/09.

COMMENTS: RV(0-2).

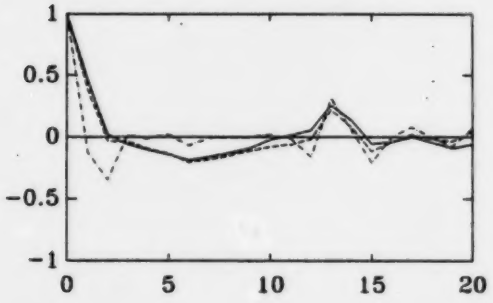
HAD5Y MEAN = 0.522 SLOPE = -0.006 VAR RATIO = 0.543 N = 25

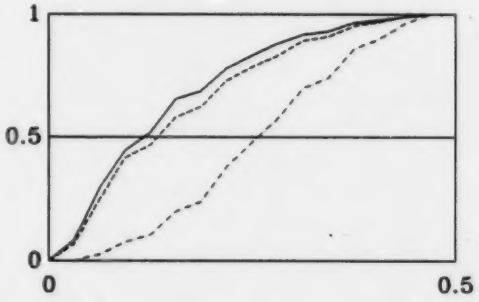




SD (0.117, 0.108, 0.122)

RHO (0.802, 0.920, 0.916)





ACF(1) (0.472, 0.392, -0.123)

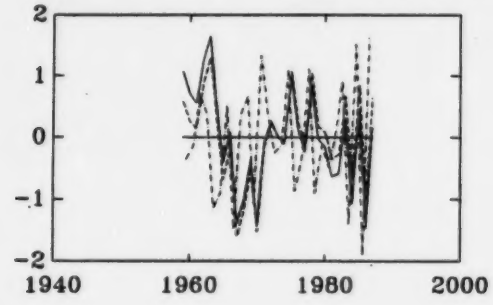
TAU (8.510, 7.462, 3.881)

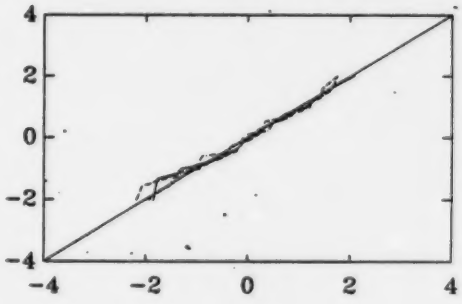
Log Transformed (base 10) Recruitment Data

..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	0.568	0.914	0.839	0.477	0.462	0.447	0.447	0.447	0.447	60-69
0.447	0.519	0.462	0.568	0.462	0.602	0.643	0.447	0.477	0.491	70-79
0.519	0.447	0.491	0.491	0.462	0.477	..	..	..	..	80-89

HADDOCK 5Z HAD5Z
START YEAR = 59 END YEAR = 87 NUMBER OF DATA POINTS = 29
SOURCE: 63-85: Gavaris, CAFSAC Res. Doc. 87/101, 59-81: Woods Hole Ref. Doc. 83-23. Updated by Gavaris, CAFSAC Res. Doc. 88/64.
COMMENTS: SPA, 1 year olds in (000 000's).

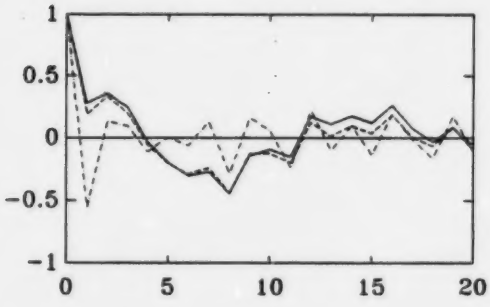
HAD5Z MEAN = 4.026 SLOPE = -0.034 VAR RATIO = 0.710 N = 29

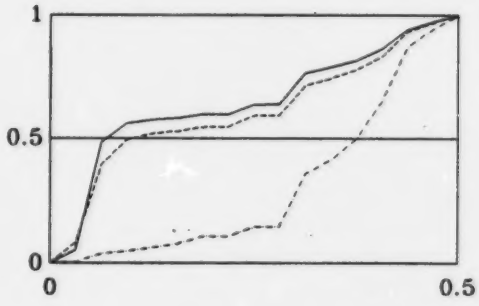




SD (0.791, 0.737, 0.942)

RHO (0.992, 0.987, 0.993)





ACF(1) (0.282, 0.187, -0.558)

TAU (14.480, 9.904, 2.663)

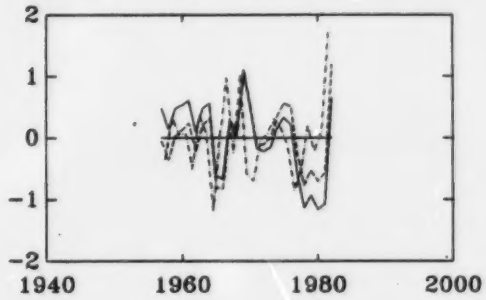
Log Transformed (base 10) Recruitment Data

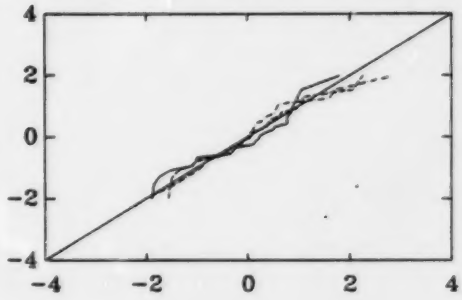
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	5.090	50-59
4.732	4.588	5.275	5.670	4.524	3.610	4.113	2.627	2.995	3.670	60-69
2.599	3.933	4.291	4.033	3.913	5.022	4.157	3.786	4.901	3.994	70-79
3.868	3.395	3.440	4.351	2.950	4.467	2.563	4.186	..	..	80-89

HADDOCK NORTH-EAST ARCTIC HADNEAR
START YEAR = 57 END YEAR = 82 NUMBER OF DATA POINTS = 26
SOURCE: Report of the Arctic Fisheries Working Group, ICES C.M. 1988.

COMMENTS: SPA, 3 year olds in (000's).

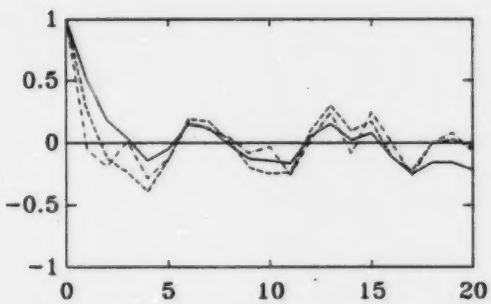
HADNEAR MEAN = 4.901 SLOPE = -0.043 VAR RATIO = 0.480 N = 26

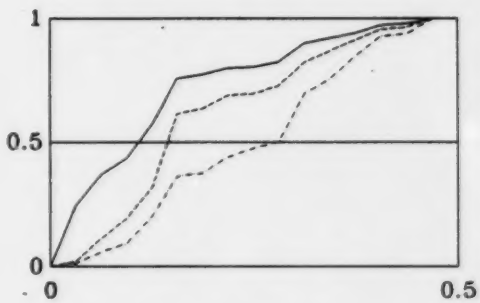




SD (0.617, 0.526, 0.605)

RHO (0.964, 0.985, 0.967)





ACF(1) (0.506, 0.262, -0.048)

TAU (9.192, 6.929, 3.567)

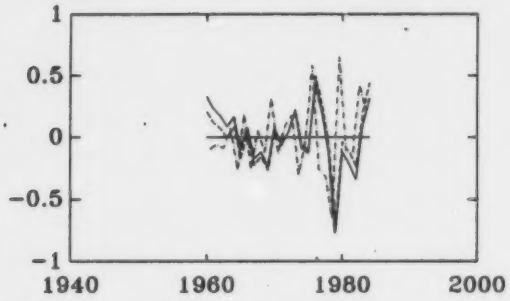
Log Transformed (base 10) Recruitment Data

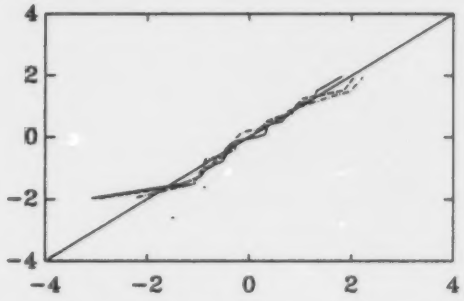
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	5.384	5.037	5.382	50-59
5.438	5.506	5.000	5.383	5.463	4.284	4.236	5.214	4.979	6.007	60-69
5.431	4.731	4.686	4.745	5.056	5.232	5.126	4.276	3.761	3.962	70-79
3.738	3.828	5.550	..	..	..	..	..	..	..	80-89

HADDOCK ICELAND HADICE
START YEAR = 60 END YEAR = 84 NUMBER OF DATA POINTS = 25
SOURCE: Marine Research Institute, Iceland, Mon Jun 20/1988. from Einar Jonsson.

COMMENTS: SPA, 2 year olds in actual numbers.

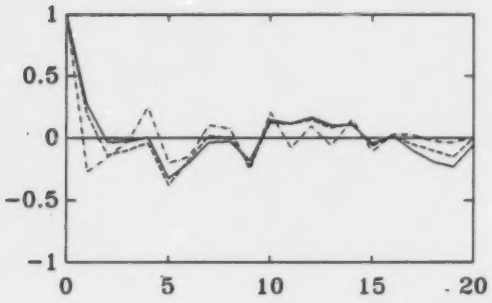
HADICE MEAN = 7.726 SLOPE = -0.010 VAR RATIO = 0.694 N = 25

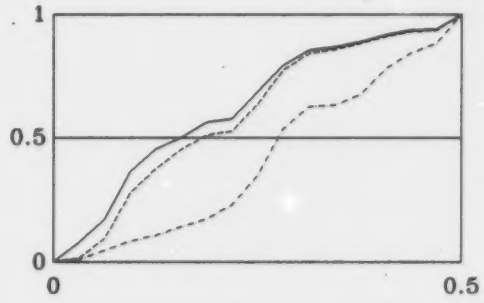




SD (0.251, 0.239, 0.295)

RHO (0.964, 0.969, 0.979)





ACF(1) (0.267, 0.185, -0.275)

TAU (6.387, 5.496, 3.629)

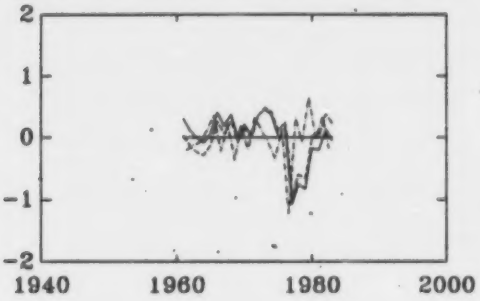
Log Transformed (base 10) Recruitment Data

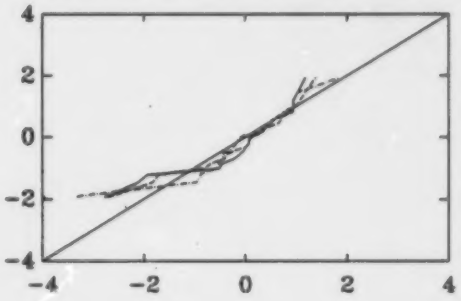
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
8.057	7.961	7.901	7.814	7.890	7.622	7.810	7.553	7.609	7.489	60-69
7.805	7.670	7.763	7.944	7.639	7.596	8.181	7.922	7.604	6.950	70-79
7.609	7.510	7.387	7.813	8.044	..	..	..	..	..	80-89

HADDOCK FAROE PLATEAU HADFAPL
START YEAR - 61 END YEAR - 83 NUMBER OF DATA POINTS - 23
SOURCE: Report of the North-Western Working Group,ICES C.M. 1987.

COMMENTS: SPA, 1 year olds in actual numbers.

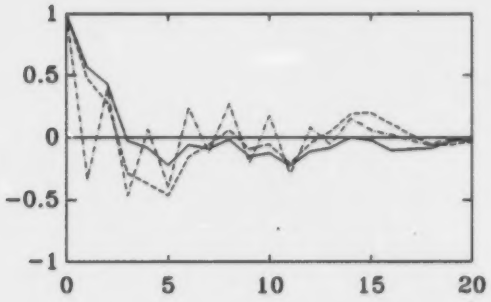
HADFAPL MEAN = 7.460 SLOPE = -0.025 VAR RATIO = 0.440 N = 23

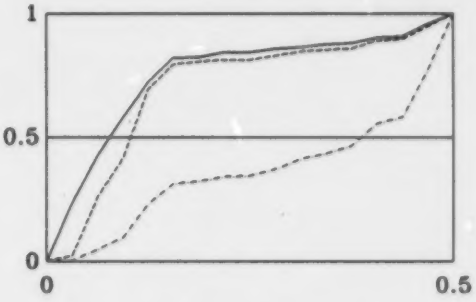




SD (0.389, 0.352, 0.365)

RHO (0.915, 0.956, 0.930)





ACF(1) (0.565, 0.474, -0.335)

TAU (12.897, 9.678, 2.585)

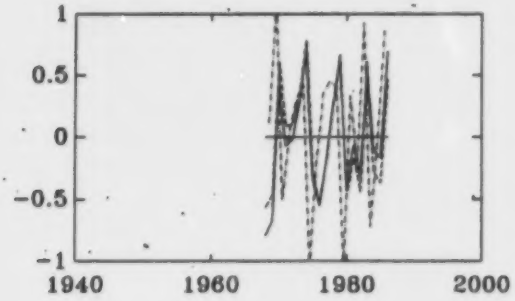
Log Transformed (base 10) Recruitment Data

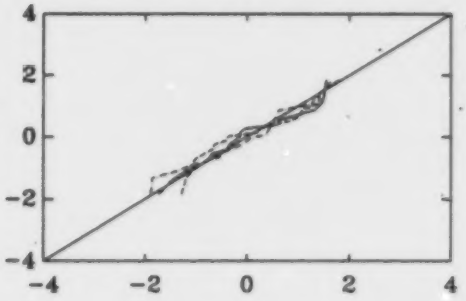
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	7.766	7.568	7.449	7.377	7.508	7.866	7.643	7.831	7.464	60-69
7.671	7.487	7.813	7.923	7.828	7.490	7.611	6.384	6.710	6.633	70-79
7.287	7.260	7.590	7.415	..	..	..	..	..	..	80-89

HADDOCK VIa HADVIa
START YEAR - 68 END YEAR - 86 NUMBER OF DATA POINTS - 19
SOURCE: Report of the North Sea Roundfish Working Group. ICES C.M. 1988.

COMMENTS: SPA, 0 year olds in (000's).

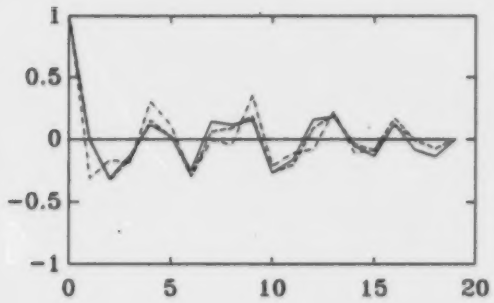
HADVIa MEAN = 5.070 SLOPE = 0.025 VAR RATIO = 0.891 N = 19

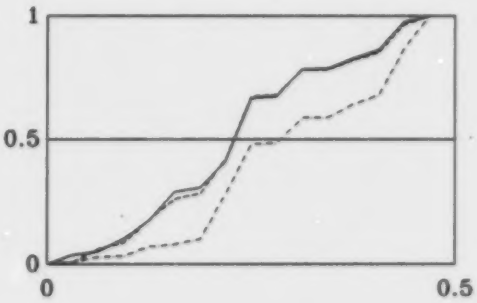




SD (0.459, 0.438, 0.613)

RHO (0.980, 0.963, 0.982)





ACF(1) (0.002, -0.010, -0.310)

TAU (4.353, 4.376, 3.491)

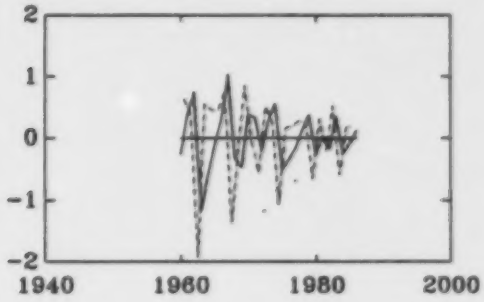
Log Transformed (base 10) Recruitment Data

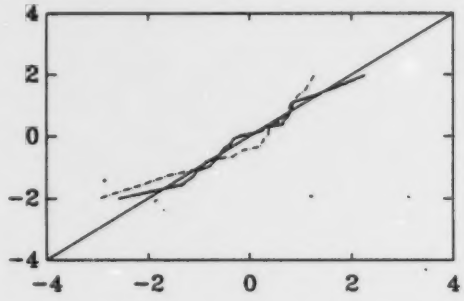
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	..	..	..	4.279	4.395	60-69
5.505	5.004	5.048	5.357	5.783	4.725	4.518	4.889	5.342	5.737	70-79
4.668	5.006	4.756	5.682	4.961	4.905	5.764	..	..	..	80-89

HADDOCK NORTH SEA HADNS
START YEAR - 60 END YEAR - 86 NUMBER OF DATA POINTS - 27
SOURCE: Report of the North Sea Roundfish Working Group. ICES C.M. 1988.

COMMENTS: SPA, 0 year olds in (000's).

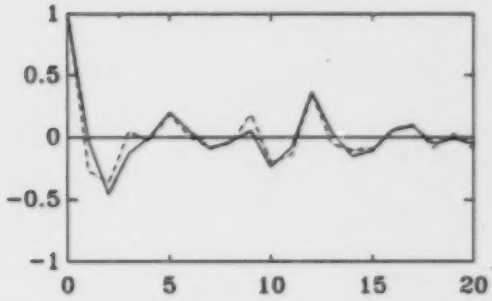
HADNS MEAN = 7.445 SLOPE = 0.001 VAR RATIO = 1.053 N = 27

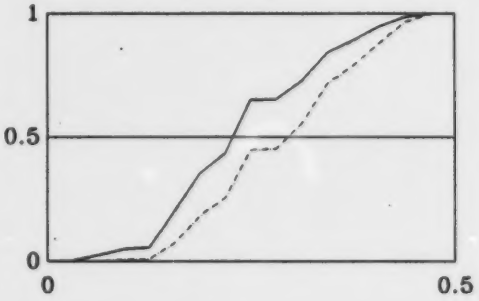




SD (0.456, 0.456, 0.862)

RHO (0.983, 0.983, 0.929)





ACF(1) (-0.022, -0.022, -0.272)

TAU (4.379, 4.385, 3.382)

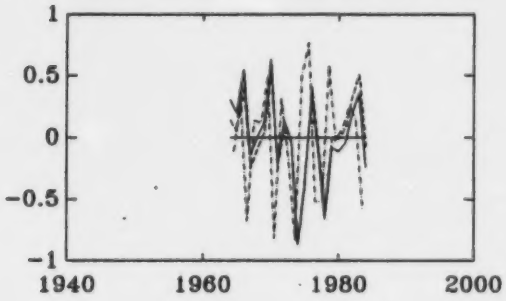
Log Transformed (base 10) Recruitment Data

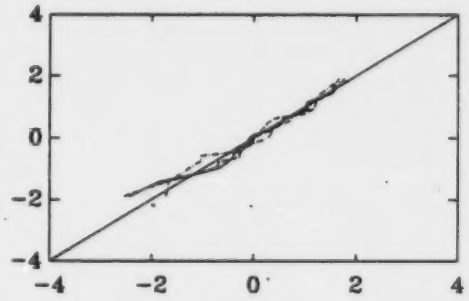
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
7.176	7.808	8.188	6.267	6.830	7.291	7.730	8.476	7.118	6.972	60-69
7.830	7.778	7.218	7.746	8.007	6.936	7.092	7.290	7.567	7.825	70-79
7.168	7.480	7.274	7.798	7.205	7.368	7.568	..	..	..	80-89

HERRING 4WX HERR4WX
START YEAR = 64 END YEAR = 84 NUMBER OF DATA POINTS = 21
SOURCE: Stephensen et al., CAFSAC 87/75, updated by Stephensen.

COMMENTS: SPA, 1 year olds in (000's).

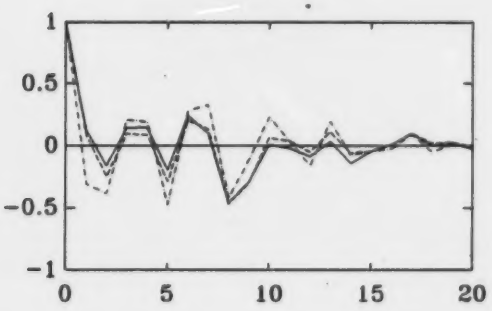
HERR4WX MEAN = 6.245 SLOPE = -0.016 VAR RATIO = 0.884 N = 21

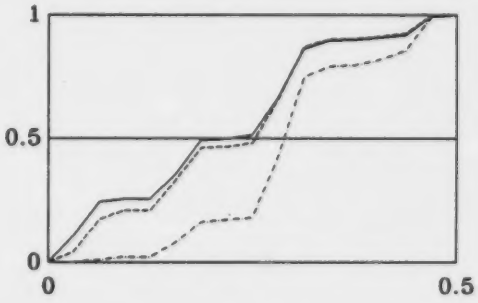




SD (0.356, 0.342, 0.474)

RHO (0.982, 0.975, 0.979)





ACF(1) (0.127, 0.081, -0.309)

TAU (4.514, 3.943, 3.464)

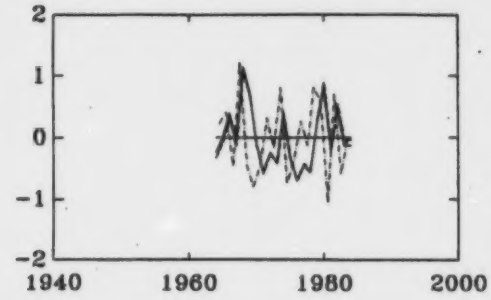
Log Transformed (base 10) Recruitment Data

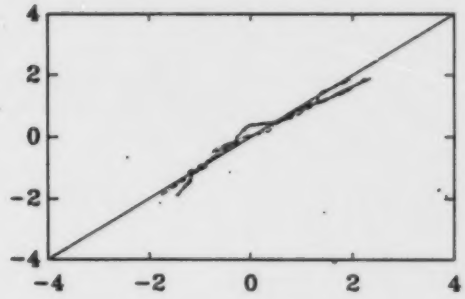
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	6.551	6.443	6.790	6.111	6.248	6.370	60-69
6.878	6.061	6.374	6.216	5.379	5.856	6.618	6.101	5.582	6.162	70-79
6.136	6.205	6.455	6.604	6.009	..	..	..	..	..	80-89

HERRING 4R (Spring spawners) HERR4Rsp
START YEAR = 64 END YEAR = 84 NUMBER OF DATA POINTS = 21
SOURCE: McQuinn, CAFSAC 88/52.

COMMENTS: SPA, 2 year olds in actual numbers.

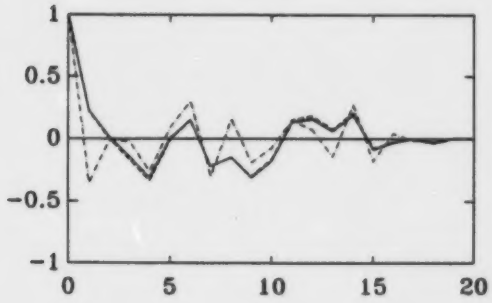
HERR4Rsp MEAN = 7.740 SLOPE = -0.009 VAR RATIO = 0.800 N = 21

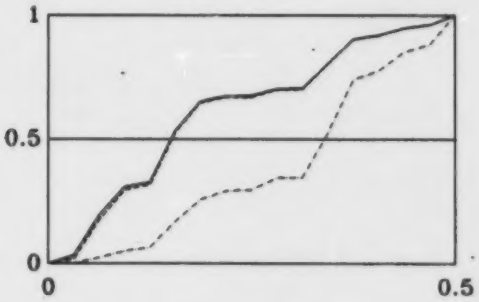




SD (0.485, 0.482, 0.614)

RHO (0.970, 0.970, 0.990)





ACF(1) (0.231, 0.217, -0.358)

TAU (6.616, 6.563, 2.950)

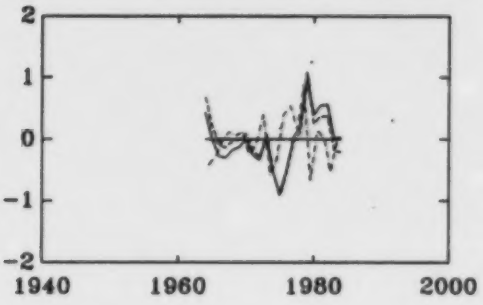
Log Transformed (base 10) Recruitment Data

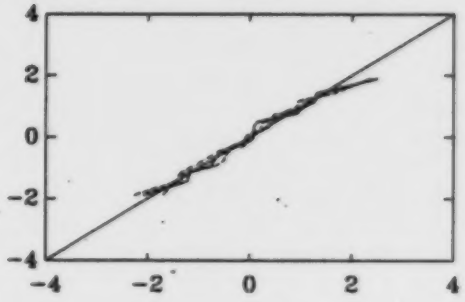
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	7.504	7.729	8.137	7.664	8.881	8.443	60-69
7.645	7.176	7.498	7.332	8.139	7.398	7.029	7.293	7.170	7.987	70-79
8.579	7.508	8.208	7.609	7.609	..	..	..	..	..	80-89

HERRING 4R (Fall spawners) HERR4Rfa
START YEAR = 64 END YEAR = 84 NUMBER OF DATA POINTS = 21
SOURCE: McQuinn, CAFSAC 88/52.

COMMENTS: SPA, 2 year olds in actual numbers.

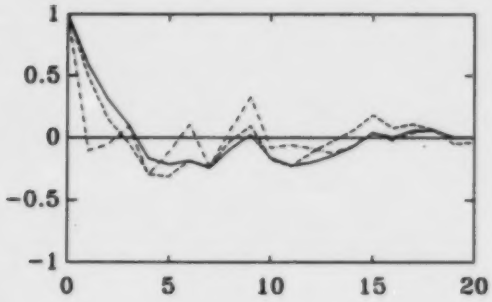
HERR4Rfa MEAN = 7.471 SLOPE = 0.024 VAR RATIO = 0.403 N = 21

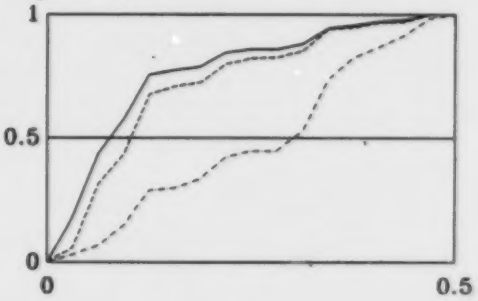




SD (0.430, 0.405, 0.386)

RHO (0.981, 0.982, 0.988)





ACF(1) (0.591, 0.487, -0.106)

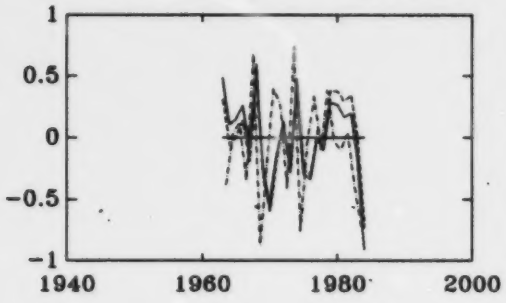
TAU (13.032, 9.771, 3.312)

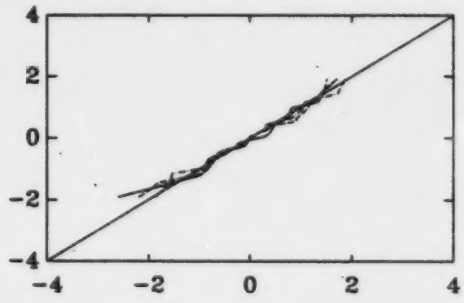
Log Transformed (base 10) Recruitment Data

..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	7.907	7.488	7.193	7.168	7.291	7.343	60-69
7.467	7.219	7.135	7.530	6.949	6.579	6.964	7.509	7.672	8.545	70-79
7.870	8.022	8.033	7.502	7.502	..	..	..	..	..	80-89

HERRING 4T (Spring spawners) HERR4Tsp
START YEAR = 63 END YEAR = 84 NUMBER OF DATA POINTS = 22
SOURCE: 67-71: Cleary CAFSAC Res Doc 83/69. 72-84: Chadwick and Cairns, CAFSAC Res. Doc. 88/38.
COMMENTS: SPA, 2 year olds in (000's).

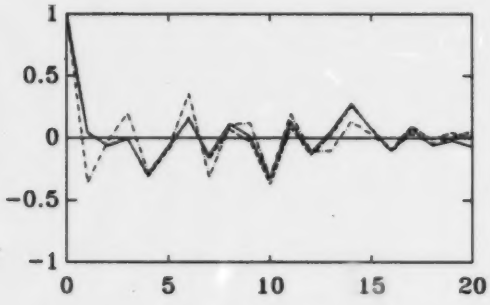
HERR4Tsp MEAN = 5.057 SLOPE = -0.017 VAR RATIO = 0.776 N = 22

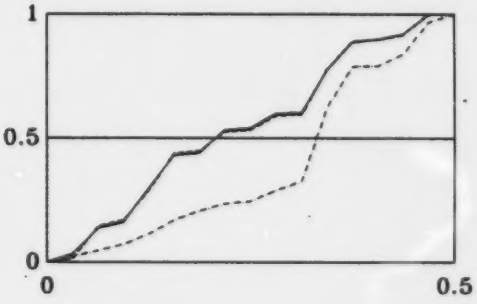




SD (0.350, 0.333, 0.436)

RHO (0.982, 0.985, 0.991)





ACF(1) (0.045, 0.042, -0.364)

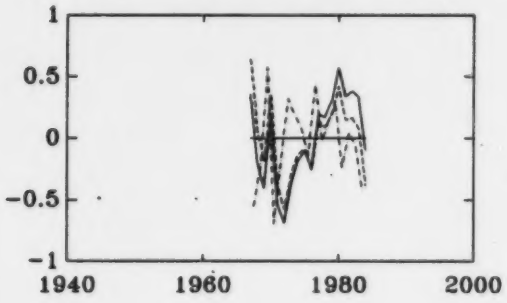
TAU (4.810, 4.798, 3.023)

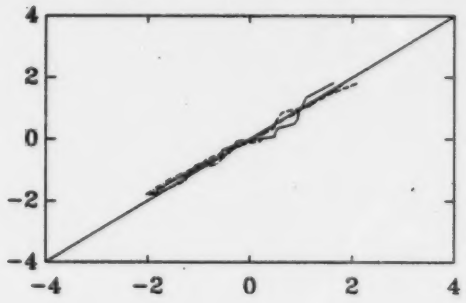
Log Transformed (base 10) Recruitment Data

..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	5.544	5.162	5.205	5.322	4.975	5.657	4.783	60-69
4.519	4.918	5.191	4.779	5.527	4.768	4.716	5.054	4.959	5.345	70-79
5.325	5.224	5.258	4.882	4.149	..	..	..	..	..	80-89

HERRING 4T (Fall spawners) HERR4Tfa
START YEAR = 67 END YEAR = 84 NUMBER OF DATA POINTS = 18
SOURCE: 67-71: Cleary CAFSAC Res Doc 83/69. 72-84: Chadwick and Cairns, CAFSAC Res. Doc. 88/38.
COMMENTS: SPA, 2 year olds in (000's).

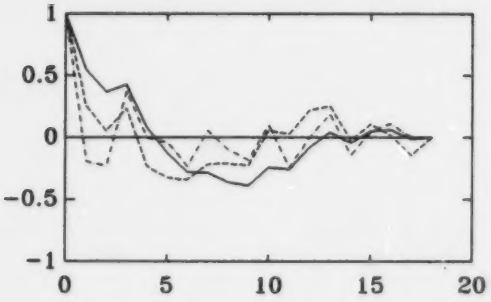
HERR4Tfa MEAN = 5.322 SLOPE = 0.034 VAR RATIO = 0.444 N = 18

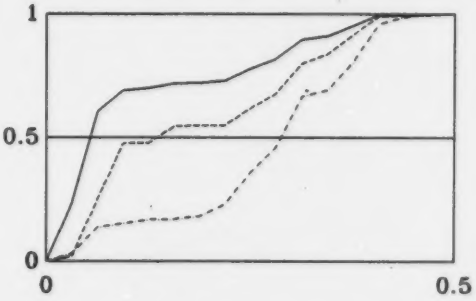




SD (0.351, 0.304, 0.331)

RHO (0.978, 0.990, 0.996)





ACF(1) (0.547, 0.253, −0.194)

TAU (18.651, 7.378, 3.478)

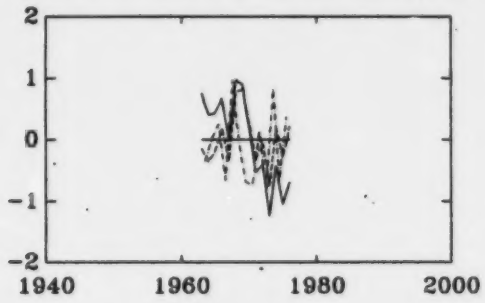
Log Transformed (base 10) Recruitment Data

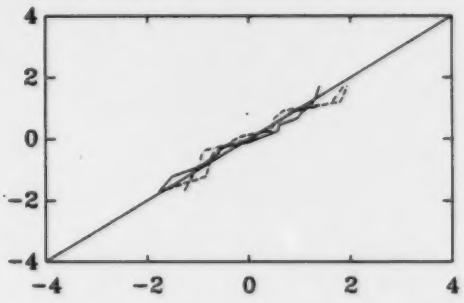
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	..	..	5.679	5.127	4.919	60-69
5.493	4.792	4.631	4.952	5.133	5.217	5.080	5.518	5.495	5.628	70-79
5.895	5.657	5.705	5.652	5.228	..	..	..	..	..	80-89

HERRING AB HERRAB
START YEAR = 63 END YEAR = 76 NUMBER OF DATA POINTS = 14
SOURCE: Winters, Wheeler Can. J. Fish and Aquatic Sci. v44,882-900

COMMENTS: SPA, 2 year olds in (000's).

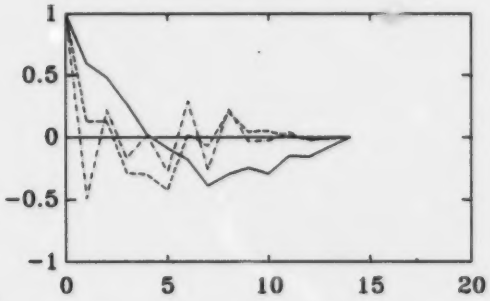
HERRAB MEAN = 4.835 SLOPE = -0.139 VAR RATIO = 0.339 N = 14

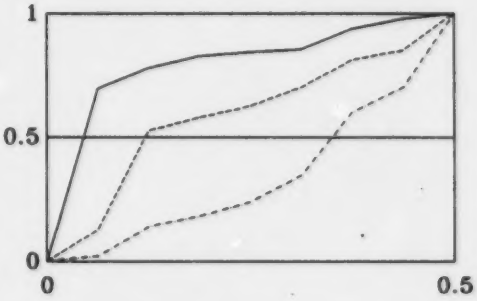




SD (0.703, 0.425, 0.579)

RHO (0.979, 0.969, 0.967)





ACF(1) (0.598, 0.126, -0.494)

TAU (22.246, 8.258, 2.855)

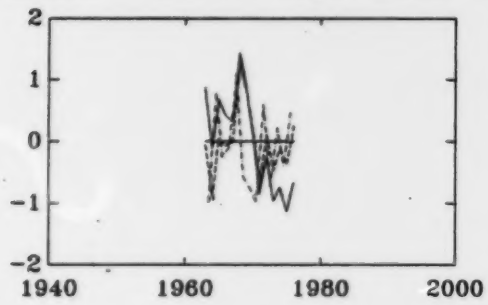
Log Transformed (base 10) Recruitment Data

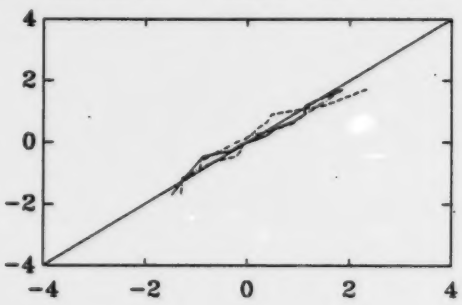
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	5.592	5.240	5.257	5.505	4.845	5.809	5.723	60-69
5.049	4.302	4.432	3.594	4.415	3.776	4.145	..	..	..	70-79
..	..	..	..	..	..	..	..	..	..	80-89

HERRING CD HERRCD
START YEAR = 63 END YEAR = 76 NUMBER OF DATA POINTS = 14
SOURCE: Winters, Wheeler Can. J. Fish and Aquatic Sci. v44,882-900

COMMENTS: SPA, 2 year olds in (000's).

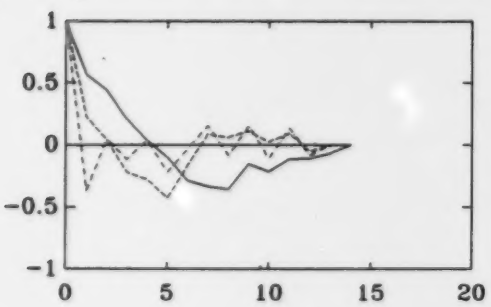
HERRCD MEAN = 4.445 SLOPE = -0.141 VAR RATIO = 0.379 N = 14

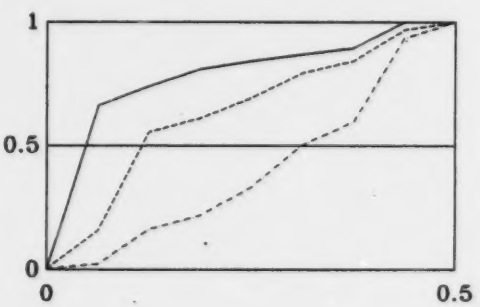




SD (0.773, 0.523, 0.672)

RHO (0.983, 0.967, 0.976)





ACF(1) (0.566, 0.224, -0.371)

TAU (21.136, 8.585, 3.207)

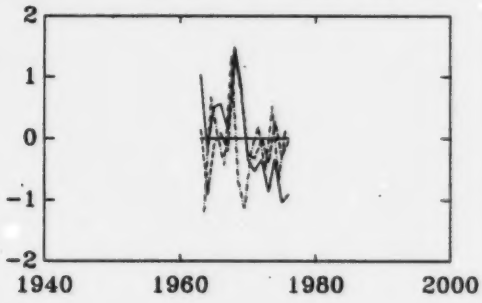
Log Transformed (base 10) Recruitment Data

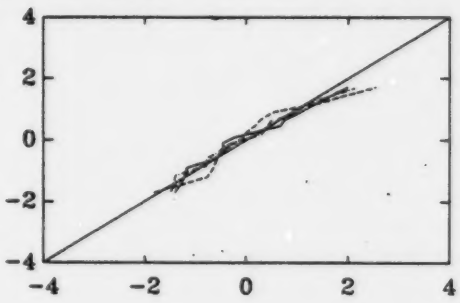
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	5.309	4.323	5.127	4.871	4.771	5.878	5.314	60-69
4.580	3.602	4.206	3.477	3.698	3.303	3.776	..	..	..	70-79
..	..	..	..	..	..	..	..	..	..	80-89

HERRING EF HERREF
START YEAR = 63 END YEAR = 76 NUMBER OF DATA POINTS = 14
SOURCE: Winters, Wheeler Can. J. Fish and Aquatic Sci. v44,882-900

COMMENTS: SPA, 2 year olds in (000's).

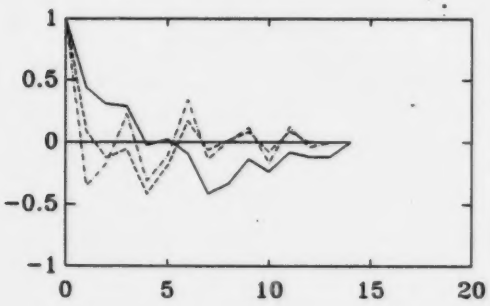
HERREF MEAN = 3.640 SLOPE = -0.136 VAR RATIO = 0.449 N = 14

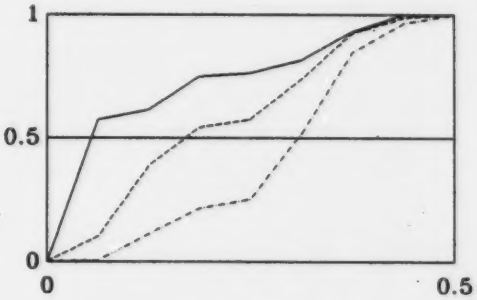




SD (0.747, 0.506, 0.708)

RHO (0.979, 0.945, 0.986)





ACF(1) (0.444, 0.088, -0.359)

TAU (18.389, 5.855, 3.243)

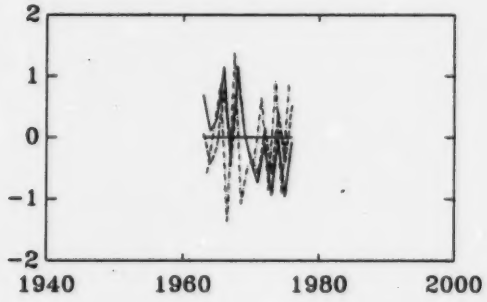
Log Transformed (base 10) Recruitment Data

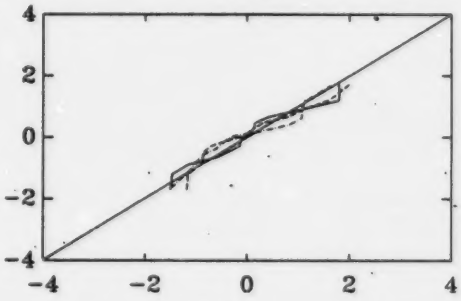
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	4.671	3.477	4.145	4.206	3.776	5.131	4.432	60-69
3.303	3.112	3.303	2.777	3.303	2.599	2.730	..	..	..	70-79
..	..	..	..	..	..	..	..	..	..	80-89

HERRING GH HERRGH
START YEAR - 63 END YEAR - 76 NUMBER OF DATA POINTS - 14
SOURCE: Winters, Wheeler Can. J. Fish and Aquatic Sci. v44,882-900

COMMENTS: SPA, 2 year olds in (000's).

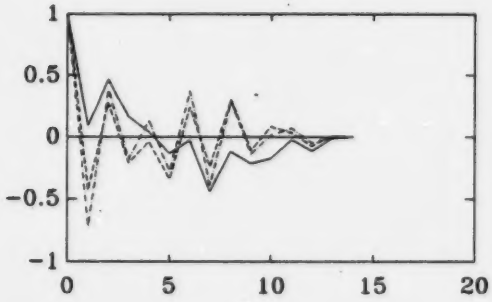
HERRGH MEAN = 4.286 SLOPE = -0.098 VAR RATIO = 0.926 N = 14

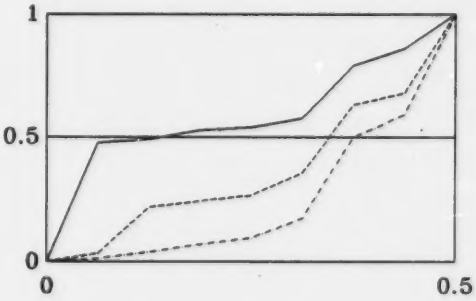




SD (0.646, 0.509, 0.878)

RHO (0.974, 0.964, 0.969)





ACF(1) (0.095, -0.428, -0.715)

TAU (7.143, 2.890, 2.656)

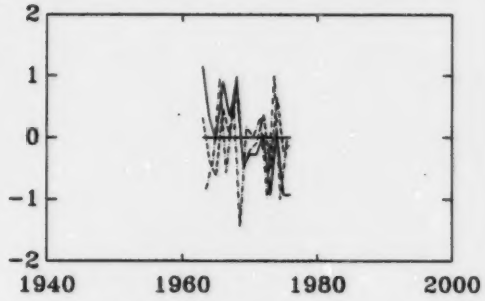
Log Transformed (base 10) Recruitment Data

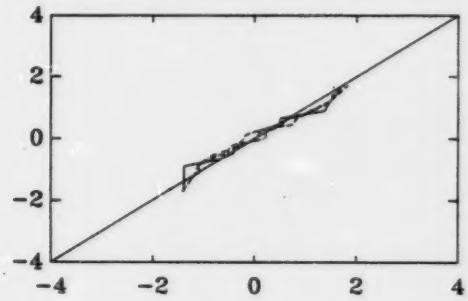
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	4.979	4.389	4.562	5.440	4.067	5.444	4.363	60-69
3.894	3.546	4.193	3.342	4.258	3.320	4.202	..	..	..	70-79
..	..	..	..	..	..	..	..	..	..	80-89

HERRING I HERRI
START YEAR = 63 END YEAR = 76 NUMBER OF DATA POINTS = 14
SOURCE: Winters, Wheeler Can. J. Fish and Aquatic Sci. v44,882-900

COMMENTS: SPA, 2 year olds in (000's).

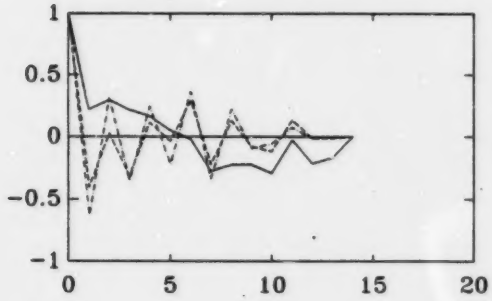
HERRI MEAN = 4.231 SLOPE = -0.127 VAR RATIO = 0.625 N = 14

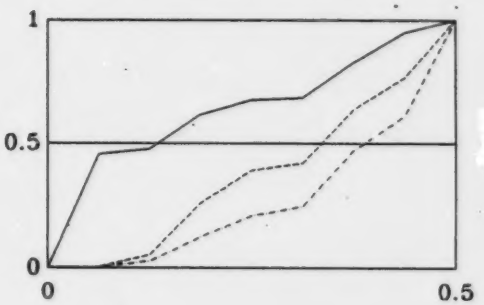




SD (0.671, 0.436, 0.750)

RHO (0.975, 0.980, 0.987)





ACF(1) (0.221, -0.402, -0.636)

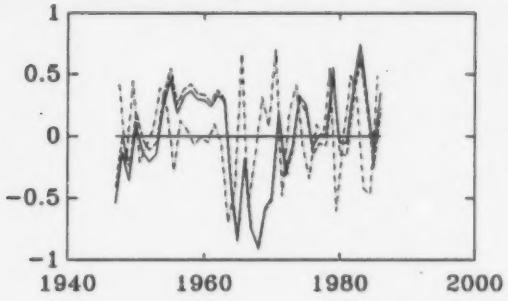
TAU (7.372, 2.977, 2.574)

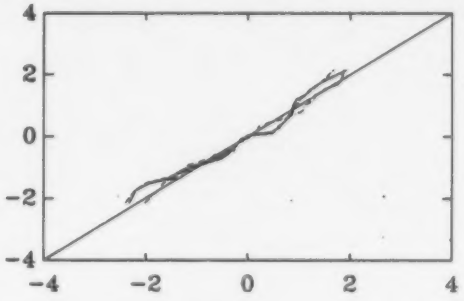
Log Transformed (base 10) Recruitment Data

..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	5.379	4.545	4.184	5.153	4.580	5.214	3.775	60-69
3.954	3.954	4.280	3.303	4.302	3.303	3.303	..	..	..	70-79
..	..	..	..	..	..	..	..	..	..	80-89

HERRING ICELAND (Summer spawners) HERRIsum
START YEAR = 47 END YEAR = 86 NUMBER OF DATA POINTS = 40
SOURCE: 1947-1969 Jakobssen R.p-v 177; 1969-1985 ICES C.M. 1986/19. Marine Research Institute, Iceland, Mon Jun 20/1988.
COMMENTS: SPA, 1 year olds in (000's).

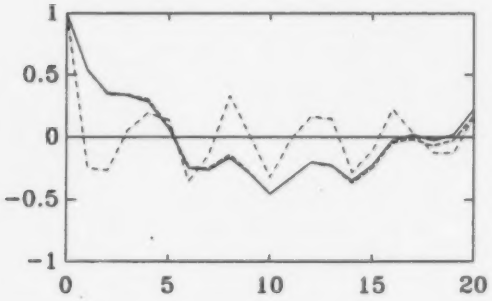
HERRIsum MEAN = 5.427 SLOPE = 0.007 VAR RATIO = 0.433 N = 40

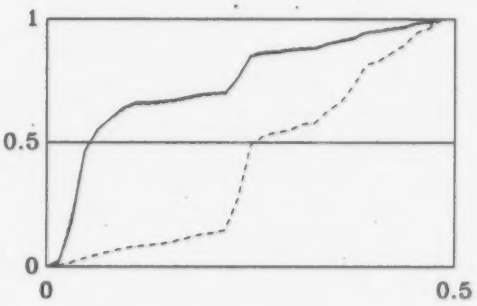




SD (0.388, 0.380, 0.361)

RHO (0.980, 0.976, 0.993)





ACF(1) (0.541, 0.541, −0.242)

TAU (18.914, 18.849, 3.924)

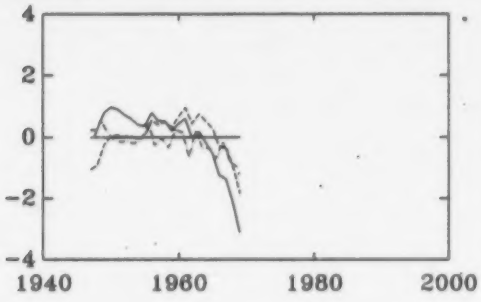
Log Transformed (base 10) Recruitment Data

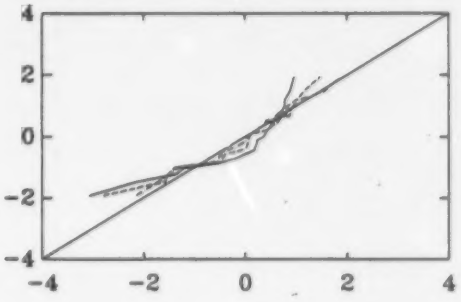
..	..	..	..	..	..	..	4.886	5.301	5.067	40-49
5.511	5.294	5.223	5.281	5.672	5.898	5.614	5.744	5.797	5.723	50-59
5.720	5.669	5.769	5.705	5.004	4.580	5.253	4.680	4.529	4.846	60-69
4.928	5.630	5.149	5.347	5.761	5.688	5.343	5.442	5.433	5.984	70-79
5.378	5.371	5.863	6.175	5.759	5.293	5.783	..	..	..	80-89

HERRING ICELAND (Spring spawners) HERRIspr
START YEAR = 47 END YEAR = 69 NUMBER OF DATA POINTS = 23
SOURCE: Jakobssen, ICES Rapports et Troces-Vervaux des Reunious v177,23-42.

COMMENTS: SPA, 1 year olds in (000 000's).

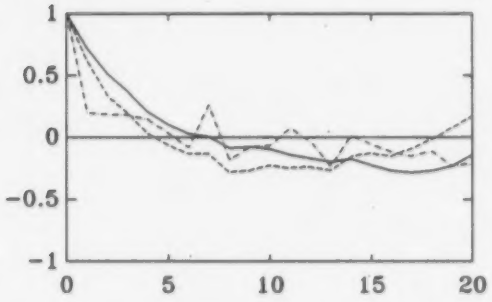
HERRIspr MEAN = 2.109 SLOPE = -0.116 VAR RATIO = 0.069 N = 23

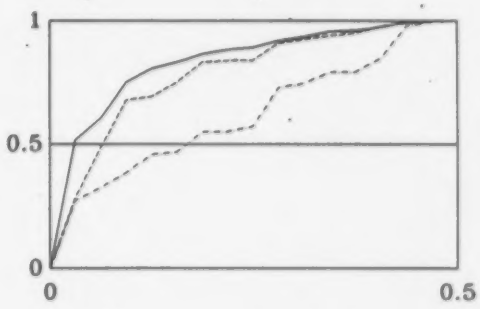




SD (1.012, 0.657, 0.375)

RHO (0.879, 0.953, 0.989)





ACF(1) (0.717, 0.619, 0.203)

TAU (33.114, 15.551, 5.941)

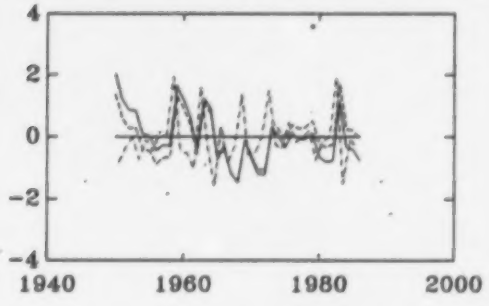
Log Transformed (base 10) Recruitment Data

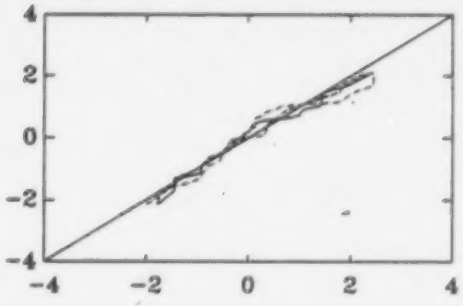
..	..	..	..	..	..	..	2.346	2.352	2.901	40-49
3.083	3.006	2.852	2.727	2.524	2.474	2.899	2.640	2.633	2.310	50-59
2.555	2.727	2.090	2.290	1.934	1.591	0.886	0.740	-0.046	-1.001	60-69
..	..	..	..	..	..	..	..	..	..	70-79
..	..	..	..	..	..	..	..	..	..	80-89

HERRING NORWAY (spring spawners) HERRNOR
START YEAR = 50 END YEAR = 86 NUMBER OF DATA POINTS = 37
SOURCE: ICES C.M. 1988/10.

COMMENTS: SPA, 3 year olds in (000 000's).

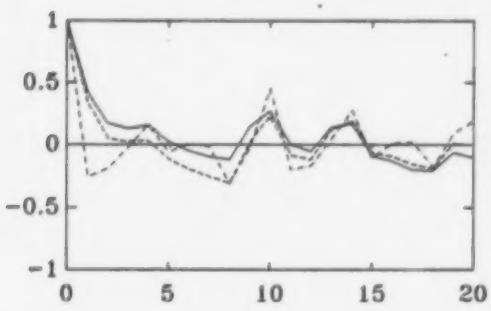
HERRNOR MEAN = 2.675 SLOPE = -0.037 VAR RATIO = 0.489 N = 37

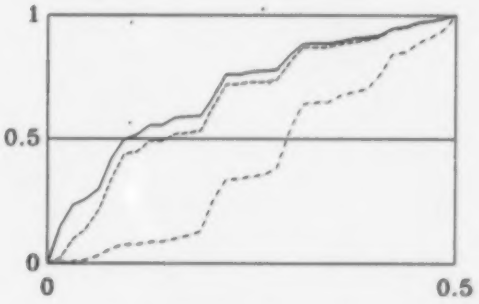




SD (0.837, 0.741, 0.828)

RHO (0.980, 0.994, 0.943)





ACF(1) (0.430, 0.344, -0.258)

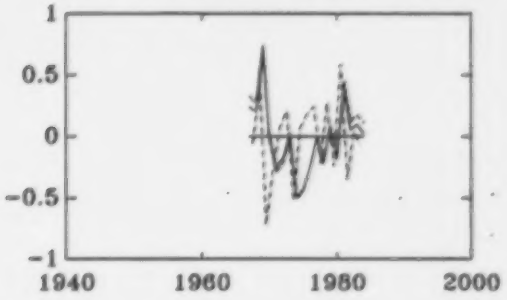
TAU (10.401, 6.858, 3.417)

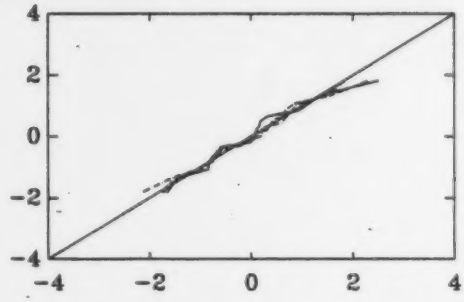
Log Transformed (base 10) Recruitment Data

..	..	..	..	..	..	..	..	..	..	40-49
4.697	3.868	3.538	3.508	2.778	2.694	2.228	2.401	2.382	4.325	50-59
3.866	3.337	2.307	3.918	3.583	2.029	2.362	1.519	1.204	2.573	60-69
2.000	1.477	1.462	2.954	2.699	2.322	2.778	2.602	2.602	2.784	70-79
2.041	1.875	1.903	3.846	2.342	2.255	1.903	..	..	..	80-89

HERRING VIa (north) HERRVIa
START YEAR = 67 END YEAR = 84 NUMBER OF DATA POINTS = 18
SOURCE: Report of the Herring Assessment Working Group for the Area South of 62N. ICES C.M. 1988/17.
COMMENTS: SPA, 2 year olds in (000's).

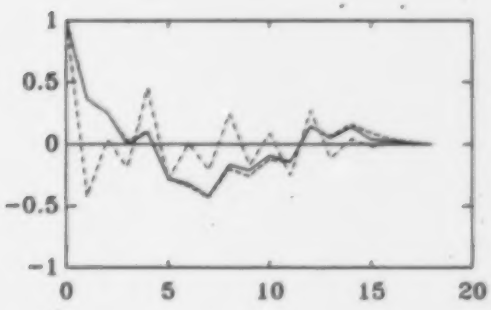
HERRVIa MEAN = 5.816 SLOPE = -0.011 VAR RATIO = 0.627 N = 18

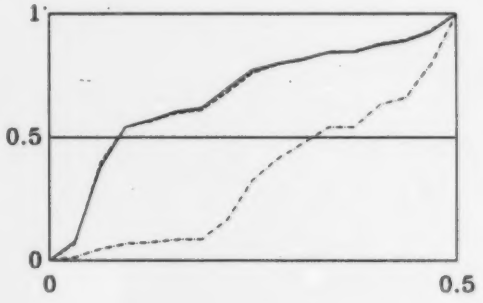




SD (0.297, 0.292, 0.332)

RHO (0.974, 0.988, 0.993)





ACF(1) (0.371, 0.363, -0.429)

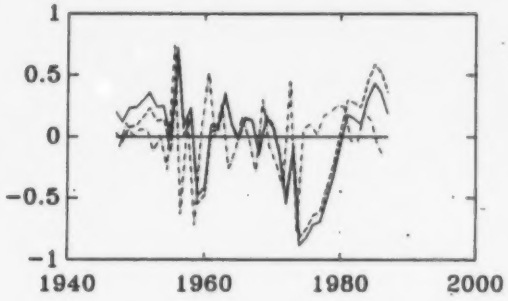
TAU (11.649, 11.819, 3.090)

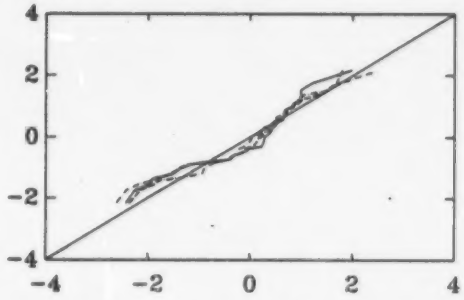
Log Transformed (base 10) Recruitment Data

..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	..	..	6.150	6.092	6.557	60-69
5.835	5.568	5.637	5.845	5.324	5.385	5.565	5.809	5.591	5.866	70-79
5.629	6.216	5.869	5.913	5.839	..	..	..	..	..	80-89

HERRING NORTH SEA HERRNS
START YEAR - 47 END YEAR - 87 NUMBER OF DATA POINTS - 41
SOURCE: Report of the Herring Assessment Working Group for the Area south of 62N. ICES C.M. 1988.
COMMENTS: SPA, 0 year olds in (000 000's).

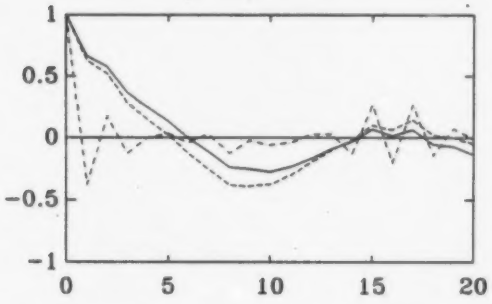
HERRNS MEAN = 3.997 SLOPE = -0.008 VAR RATIO = 0.335 N = 41

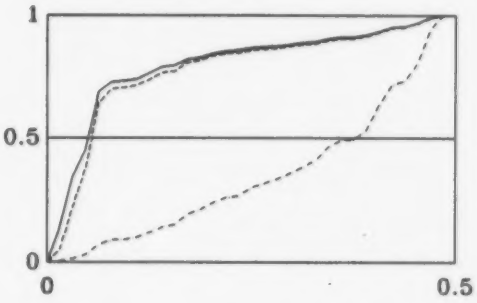




SD (0.364, 0.350, 0.298)

RHO (0.948, 0.970, 0.973)





ACF(1) (0.666, 0.633, -0.383)

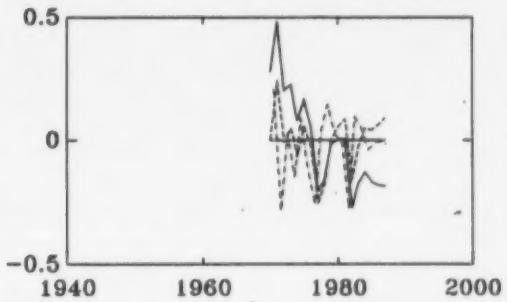
TAU (19.985, 18.483, 2.647)

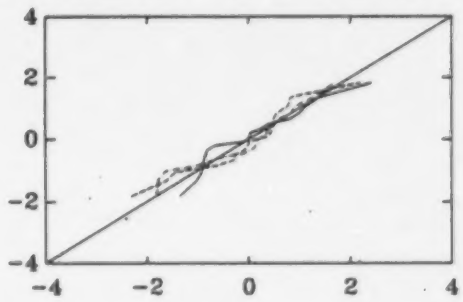
Log Transformed (base 10) Recruitment Data

..	..	..	..	..	..	..	4.199	4.117	4.228	40-49
4.236	4.297	4.358	4.243	4.248	3.978	4.719	4.086	4.238	3.518	50-59
3.580	4.093	4.090	4.358	4.097	3.987	4.152	4.130	3.851	4.155	60-69
4.079	3.857	3.447	3.892	3.114	3.176	3.279	3.301	3.477	3.670	70-79
3.929	4.176	4.146	4.100	4.301	4.433	4.352	4.185	..	..	80-89

HERRING NORTHERN IRISH SEA HERRNIRS
START YEAR - 70 END YEAR - 87 NUMBER OF DATA POINTS - 18
SOURCE: Report of the Herring Assessment Working Group for the Area South of 62N. ICES C.M. 1988/17.
COMMENTS: SPA, 1 year olds in (000's).

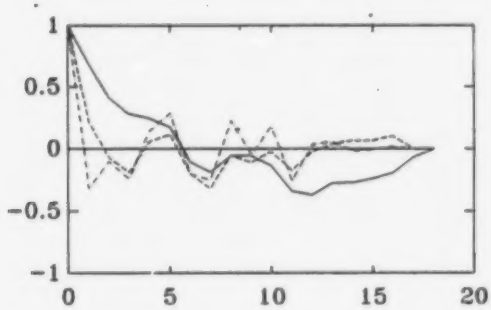
HERRNIRS MEAN = 5.342 SLOPE = -0.032 VAR RATIO = 0.244 N = 18

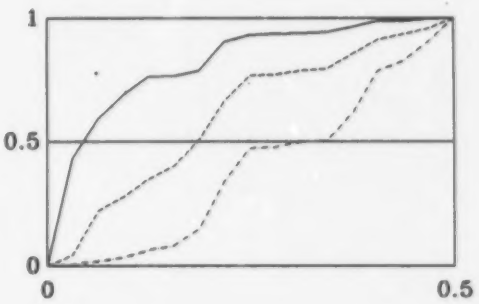




SD (0.200, 0.110, 0.140)

RHO (0.962, 0.955, 0.967)





ACF(1) (0.685, 0.215, -0.319)

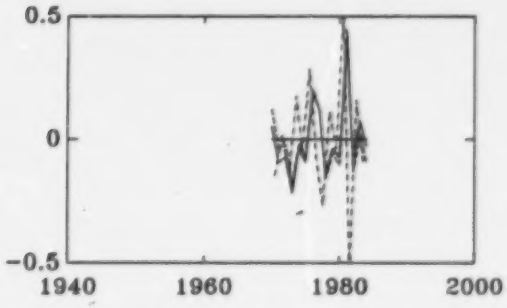
TAU (22.595, 5.394, 3.032)

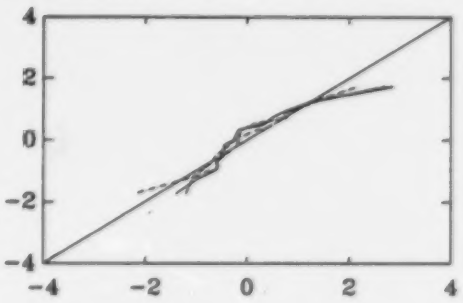
Log Transformed (base 10) Recruitment Data

..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	..	..	..	..	..	60-69
5.617	5.824	5.543	5.567	5.420	5.509	5.392	5.137	5.180	5.324	70-79
5.348	5.346	5.070	5.167	5.213	5.173	5.161	5.158	..	..	80-89

HERRING VIa (south) and VIIb,c HERRVIaVIIbc
START YEAR = 70 END YEAR = 84 NUMBER OF DATA POINTS = 15
SOURCE: Report of the Herring Assessment Working Group for the Area South of 62N. ICES C.M. 1988/17.
COMMENTS: SPA, 2 year olds in (000's).

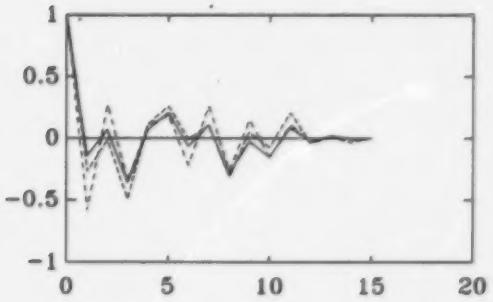
HERRVIaVII MEAN = 5.394 SLOPE = 0.010 VAR RATIO = 1.219 N = 15

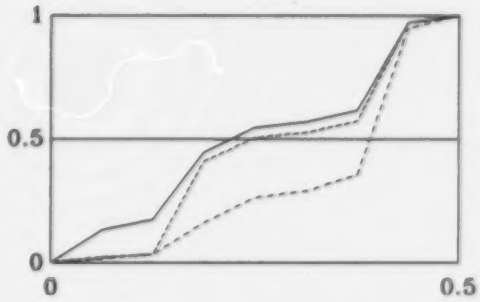




SD (0.156, 0.151, 0.244)

RHO (0.921, 0.936, 0.979)





ACF(1) (-0.143, -0.266, -0.581)

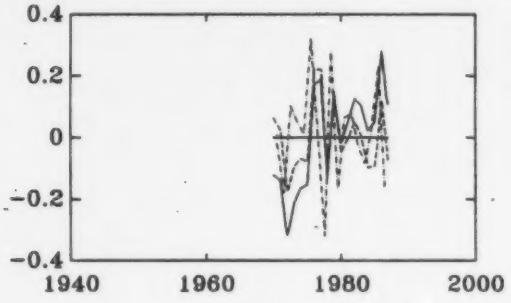
TAU (4.525, 4.059, 2.562)

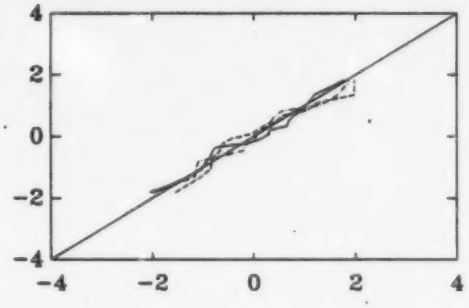
Log Transformed (base 10) Recruitment Data

..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	..	..	..	..	..	60-69
5.447	5.301	5.322	5.176	5.352	5.302	5.588	5.512	5.244	5.359	70-79
5.320	5.839	5.311	5.470	5.368	..	..	..	..	..	80-89

HERRING BALTIC AREAS 22&24 HERR2224
START YEAR = 70 END YEAR = 87 NUMBER OF DATA POINTS = 18
SOURCE: Report of the Working Group on Assessment of Pelagic Stocks in the Baltic. ICES C.M. 1988/18.
COMMENTS: SPA, 0 year olds in (000 000's).

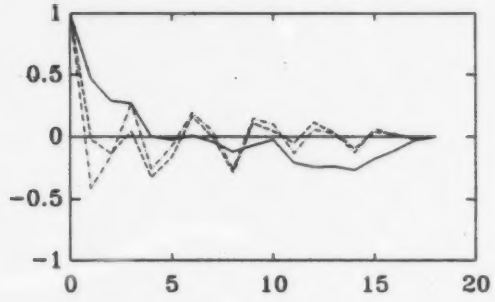
HERR2224 MEAN = 3.526 SLOPE = 0.022 VAR RATIO = 0.528 N = 18

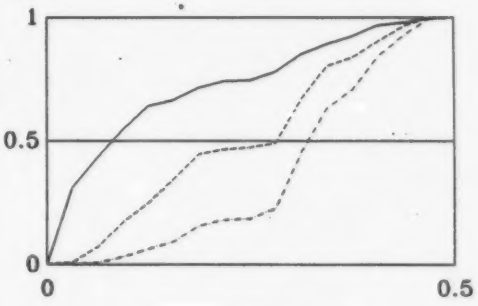




SD (0.159, 0.113, 0.164)

RHO (0.983, 0.967, 0.983)





ACF(1) (0.469, -0.016, -0.415)

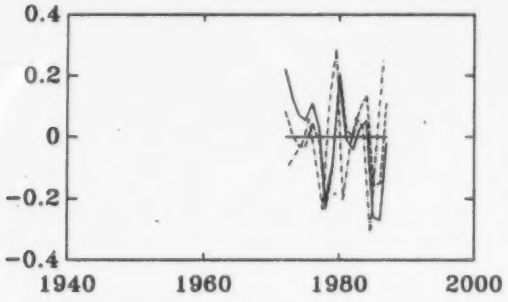
TAU (12.358, 3.535, 3.122)

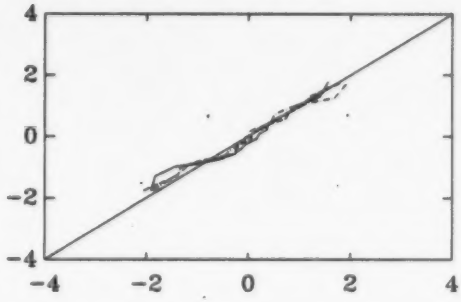
Log Transformed (base 10) Recruitment Data

..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	..	..	..	..	..	60-69
3.406	3.388	3.210	3.313	3.361	3.374	3.695	3.716	3.395	3.673	70-79
3.509	3.575	3.653	3.632	3.549	3.576	3.809	3.636	..	..	80-89

HERRING SOUTHERN CENTRAL BALTIC HERRSCB
START YEAR - 72 END YEAR - 87 NUMBER OF DATA POINTS - 16
SOURCE: Report of the Working Group on Assessment of Pelagic Stocks in the Baltic. ICES C.M. 1988/18.
COMMENTS: SPA, 0 year olds in (000 000's).

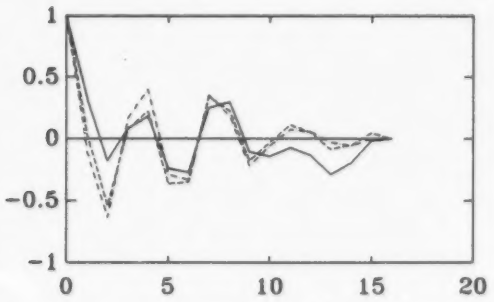
HERRSCB MEAN = 3.839 SLOPE = -0.018 VAR RATIO = 0.625 N = 16

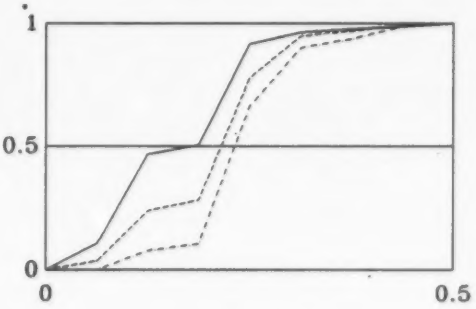




SD (0.142, 0.114, 0.159)

RHO (0.973, 0.989, 0.986)





ACF(1) (0.331, 0.034, -0.112)

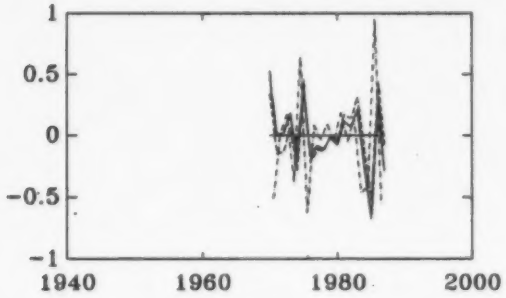
TAU (5.620, 4.648, 4.313)

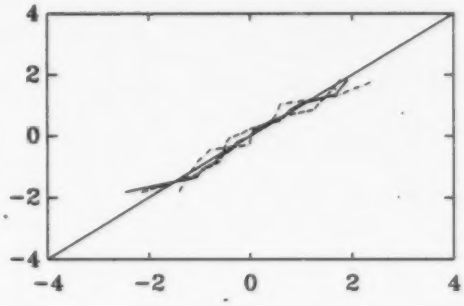
Log Transformed (base 10) Recruitment Data

..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	..	..	..	..	..	60-69
..	..	4.061	3.968	3.914	3.892	3.949	3.869	3.633	3.748	70-79
4.037	3.833	3.799	3.863	3.892	3.580	3.568	3.820	..	..	80-89

HERRING GULF OF RIGA HERRGRIGA
START YEAR - 70 END YEAR - 87 NUMBER OF DATA POINTS - 18
SOURCE: Report of the Working Group on Assessment of Pelagic Stocks in the Baltic. ICES C.M. 1988/18.
COMMENTS: SPA, 0 year olds in (000 000's).

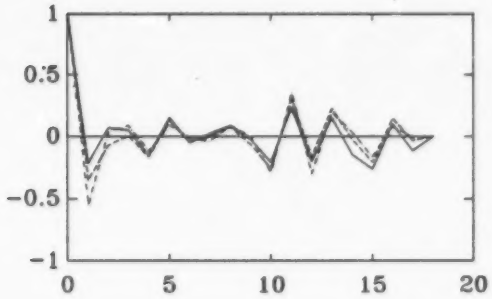
HERRGRIGA MEAN = 3.165 SLOPE = -0.022 VAR RATIO = 1.131 N = 18

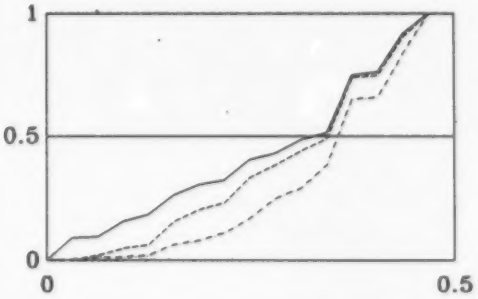




SD (0.274, 0.249, 0.412)

RHO (0.981, 0.977, 0.960)





ACF(1) (-0.216, -0.355, -0.551)

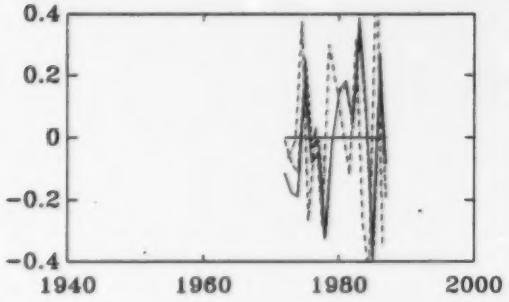
TAU (3.051, 2.898, 2.797)

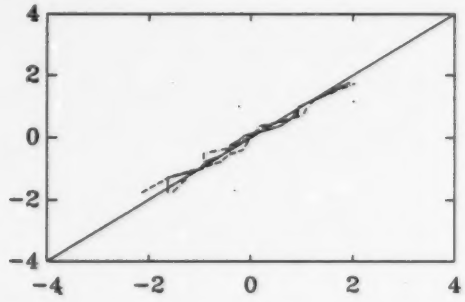
Log Transformed (base 10) Recruitment Data

..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	..	..	..	..	..	60-69
3.690	3.182	3.176	3.352	2.978	3.623	3.000	3.083	3.051	3.146	70-79
3.090	3.281	3.233	3.378	2.908	2.491	3.439	2.875	..	..	80-89

HERRING BALTIC AREAS 28&29S HERR2829S
START YEAR - 72 END YEAR - 87 NUMBER OF DATA POINTS - 16
SOURCE: Report of the Working Group on Assessment of Pelagic Stocks in the Baltic. ICES C.M. 1988/18.
COMMENTS: SPA, 0 year olds in (000 000's).

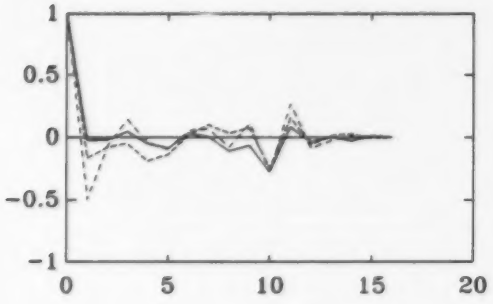
HERR2829S MEAN = 3.757 SLOPE = 0.014 VAR RATIO = 1.076 N = 16

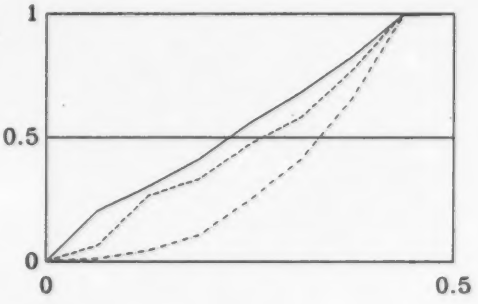




SD (0.200, 0.189, 0.294)

RHO (0.990, 0.988, 0.984)





ACF(1) (-0.024, -0.163, -0.495)

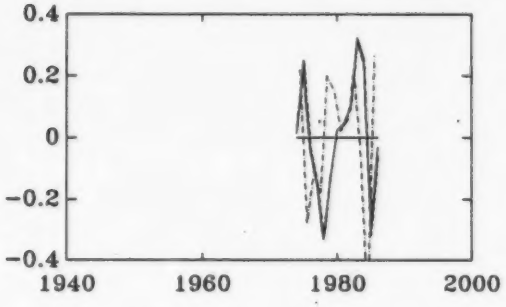
TAU (4.446, 3.764, 2.987)

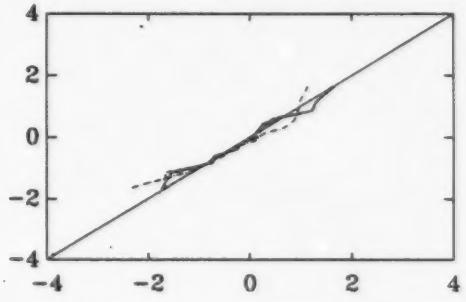
Log Transformed (base 10) Recruitment Data

..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	..	..	..	..	..	60-69
..	..	3.643	3.580	3.568	3.944	3.677	3.712	3.431	3.731	70-79
3.908	3.940	3.820	4.143	3.875	3.431	4.029	3.672	..	..	80-89

HERRING ARCHIPELAGO AND BOTHNIAN SEAS HERRARBO
START YEAR - 74 END YEAR - 86 NUMBER OF DATA POINTS - 13
SOURCE: Report of the Working Group on Assessment of Pelagic Stocks in the Baltic. ICES C.M. 1988/18.
COMMENTS: SPA, 0 year olds in (000 000's).

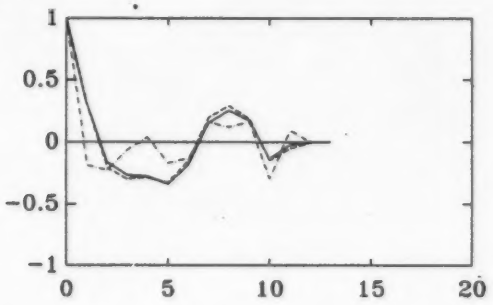
HERRARBO MEAN = 3.668 SLOPE = 0.004 VAR RATIO = 0.750 N = 13

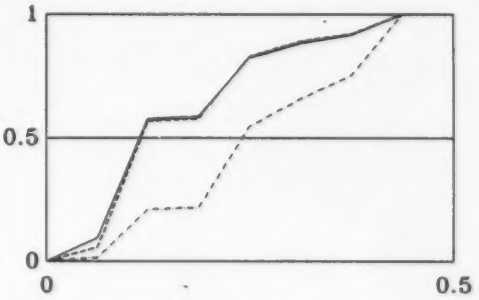




SD (0.192, 0.191, 0.235)

RHO (0.988, 0.983, 0.955)





ACF(1) (0.307, 0.298, -0.185)

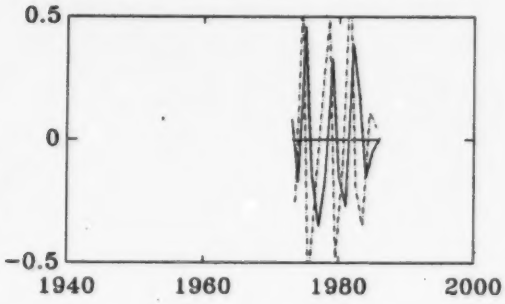
TAU (8.687, 8.567, 4.140)

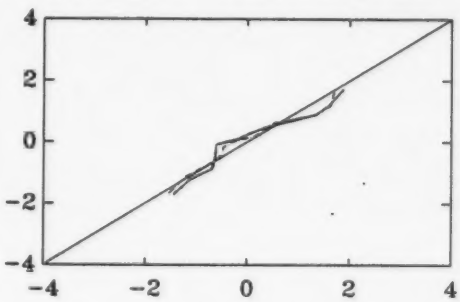
Log Transformed (base 10) Recruitment Data

..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	..	..	..	..	..	60-69
..	..	..	..	3.682	3.901	3.622	3.514	3.335	3.535	70-79
3.692	3.715	3.770	3.992	3.920	3.371	3.637	..	..	..	80-89

HERRING BOTHNIAN BAY HERRBOTB
START YEAR - 73 END YEAR - 86 NUMBER OF DATA POINTS - 14
SOURCE: Report of the Working Group on Assessment of Pelagic Stocks in the Baltic. ICES C.M. 1988/18.
COMMENTS: SPA, 1 year olds in (000 000's).

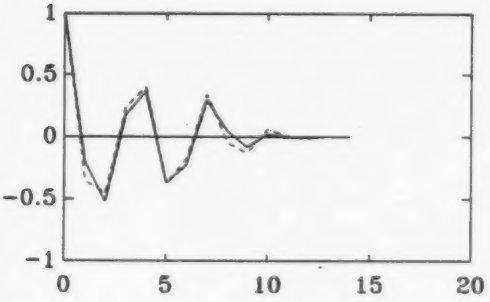
HERRBOTB MEAN = 2.618 SLOPE = 0.001 VAR RATIO = 1.287 N = 14

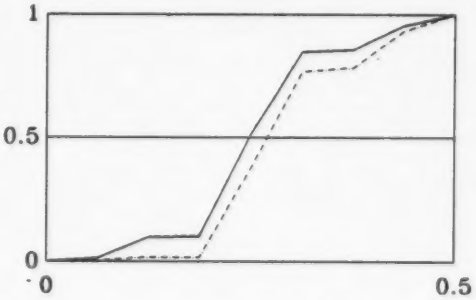




SD (0.244, 0.244, 0.391)

RHO (0.961, 0.960, 0.979)





ACF(1) (-0.199, -0.200, -0.356)

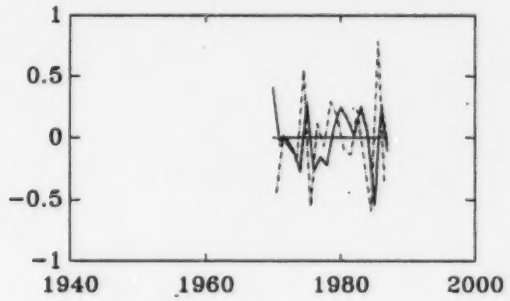
TAU (4.023, 4.023, 3.700)

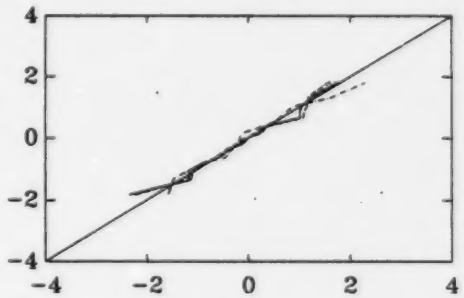
Log Transformed (base 10) Recruitment Data

..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	..	..	..	..	..	60-69
..	..	..	2.697	2.446	3.072	2.467	2.267	2.459	2.947	70-79
2.467	2.348	3.007	2.814	2.464	2.574	2.624	..	..	..	80-89

HERRING GULF OF FINLAND HERRGFIN
START YEAR = 70 END YEAR = 87 NUMBER OF DATA POINTS = 18
SOURCE: Report of the Working Group on Assessment of Pelagic Stocks in the Baltic. ICES C.M. 1988/18.
COMMENTS: SPA, 0 year olds in (000 000's).

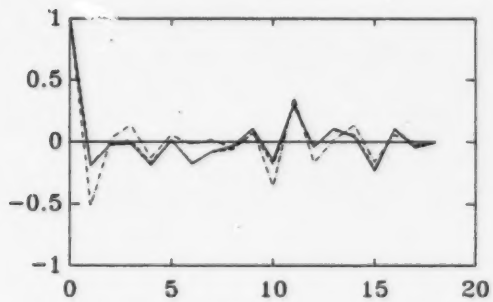
HERRGFIN MEAN = 3.502 SLOPE = -0.004 VAR RATIO = 1.158 N = 18

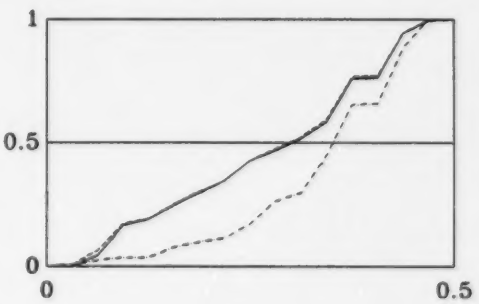




SD (0.235, 0.234, 0.357)

RHO (0.987, 0.985, 0.983)





ACF(1) (-0.193, -0.184, -0.520)

TAU (3.316, 3.356, 2.845)

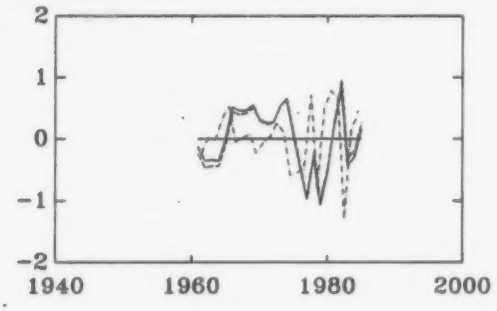
Log Transformed (base 10) Recruitment Data

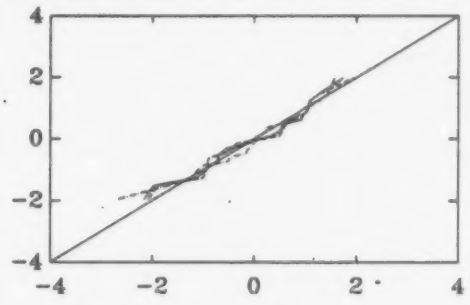
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	..	..	..	..	..	60-69
3.914	3.473	3.491	3.400	3.243	3.792	3.236	3.350	3.281	3.574	70-79
3.748	3.650	3.512	3.740	3.545	2.954	3.741	3.391	..	..	80-89

MACKEREL Areas 2 to 6 MACK2-6
START YEAR = 61 END YEAR = 85 NUMBER OF DATA POINTS = 25
SOURCE: Castonguay and Landry, CAFSAC Res. Doc. 87/47.

COMMENTS: SPA, 1 year olds in (000 000's).

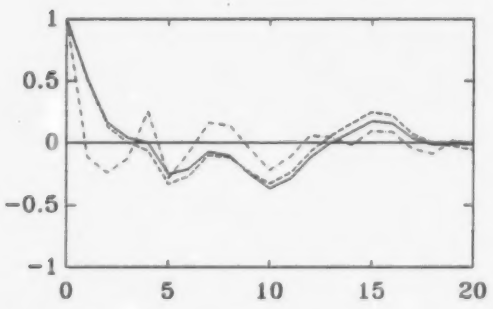
MACK2-6 MEAN = 3.105 SLOPE = -0.010 VAR RATIO = 0.491 N = 25

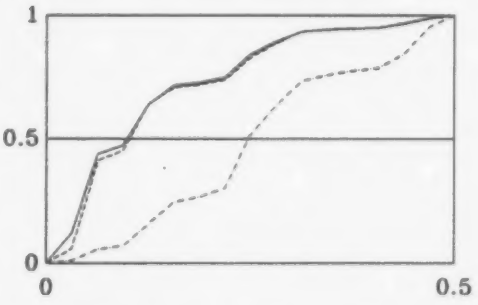




SD (0.496, 0.491, 0.492)

RHO (0.983, 0.982, 0.978)





ACF(1) (0.525, 0.506, -0.116)

TAU (10.122, 9.827, 4.031)

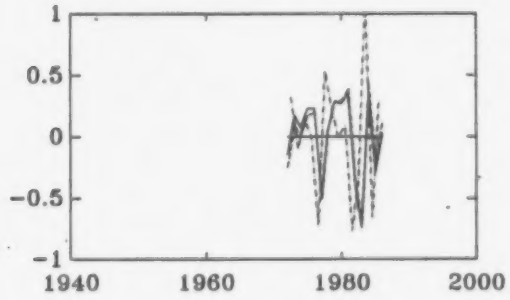
Log Transformed (base 10) Recruitment Data

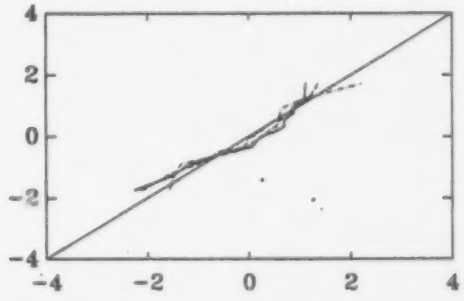
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	2.980	2.744	2.762	2.751	3.091	3.619	3.563	3.570	3.655	60-69
3.428	3.360	3.375	3.638	3.748	3.165	2.621	2.124	2.834	2.034	70-79
2.541	3.327	3.965	2.671	2.804	3.260	..	..	..	..	80-89

MACKEREL WESTERN MACKWS
START YEAR = 72 END YEAR = 86 NUMBER OF DATA POINTS = 15
SOURCE: Report of the Mackerel working Group,ICES C.M. 1988/12.

COMMENTS: SPA, 0 year olds in (000 000's).

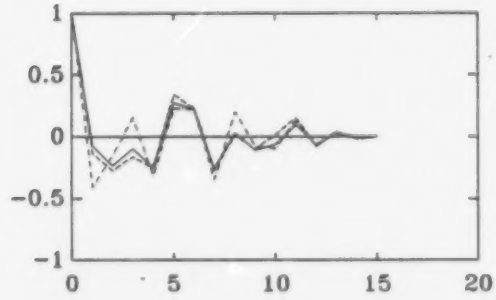
MACKWS MEAN = 3.462 SLOPE = -0.014 VAR RATIO = 1.140 N = 15

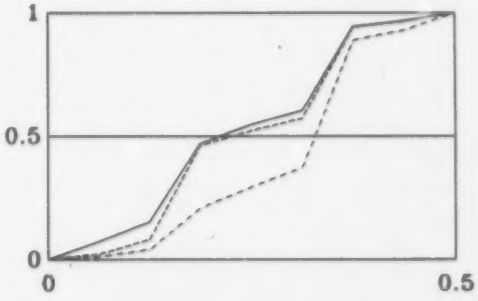




SD (0.330, 0.324, 0.498)

RHO (0.949, 0.972, 0.974)





ACF(1) (-0.071, -0.131, -0.409)

TAU (4.721, 4.376, 3.050)

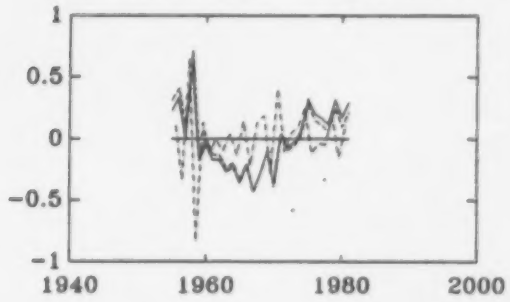
Log Transformed (base 10) Recruitment Data

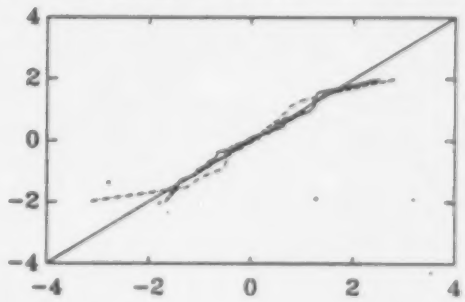
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	..	..	..	..	..	60-69
..	..	3.317	3.637	3.537	3.693	3.694	2.975	3.507	3.746	70-79
3.736	3.822	3.053	2.715	3.829	3.174	3.488	..	..	..	80-89

MENHADEN US ATLANTIC MENHADEN
START YEAR = 55 END YEAR = 81 NUMBER OF DATA POINTS = 27
SOURCE: Vaughan et al. NMFS-SPEC-178

COMMENTS: SPA, 1 year olds in (000 000's).

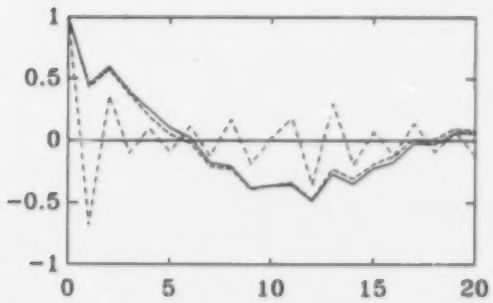
MENHADEN MEAN = 3.516 SLOPE = 0.006 VAR RATIO = 0.531 N = 27

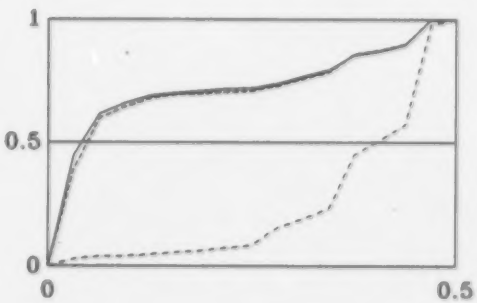




SD (0.261, 0.256, 0.269)

RHO (0.987, 0.983, 0.954)





ACF(1) (0.450, 0.429, −0.678)

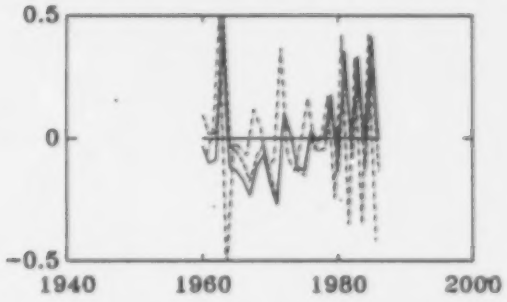
TAU (24.305, 21.003, 2.485)

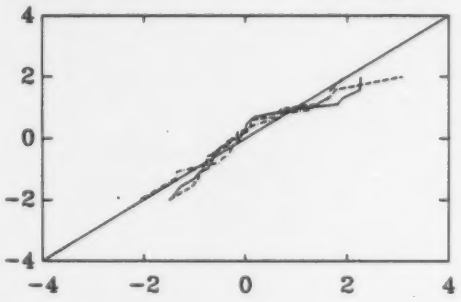
Log Transformed (base 10) Recruitment Data

..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	3.748	3.854	3.514	4.170	3.335	50-59
3.471	3.344	3.347	3.244	3.288	3.156	3.301	3.082	3.233	3.417	60-69
3.140	3.552	3.446	3.491	3.587	3.843	3.720	3.682	3.637	3.838	70-79
3.686	3.812	..	..	..	..	..	..	..	..	80-89

PLAICE NORTH SEA PLAICENS
START YEAR = 60 END YEAR = 86 NUMBER OF DATA POINTS = 27
SOURCE: Report of the North Sea Flatfish Working Group, ICES C.M. 1988.
Data could be updated using recruitment series.
COMMENTS: SPA, 1 year olds in actual numbers.

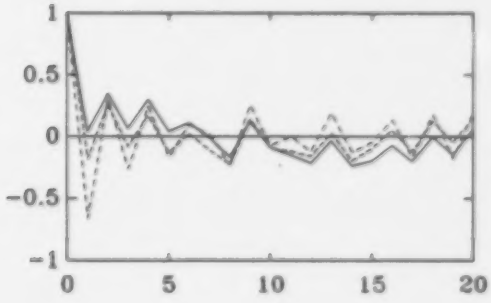
PLAICENS MEAN = 8.637 SLOPE = 0.010 VAR RATIO = 0.994 N = 27

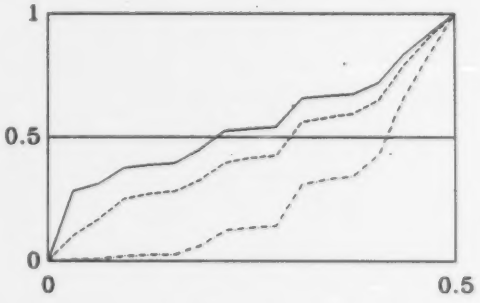




SD (0.184, 0.167, 0.260)

RHO (0.937, 0.940, 0.983)





ACF(1) (0.042, -0.179, -0.661)

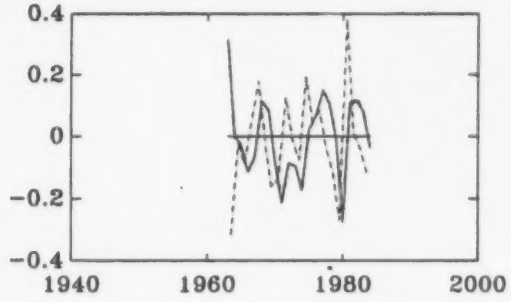
TAU (4.803, 3.347, 2.405)

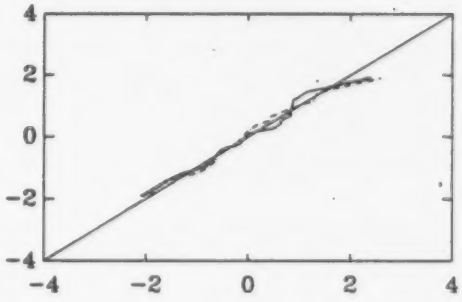
Log Transformed (base 10) Recruitment Data

..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
8.604	8.535	8.549	9.053	8.520	8.507	8.470	8.403	8.521	8.570	60-69
8.453	8.366	8.732	8.655	8.521	8.505	8.670	8.626	8.642	8.813	70-79
8.571	8.989	8.641	8.970	8.619	9.051	8.635	..	..	..	80-89

PLAICE IRISH SEA (VIIa) PLACIS
START YEAR = 63 END YEAR = 84 NUMBER OF DATA POINTS = 22
SOURCE: Report of the Irish Sea and Bristol Channel Working Group, ICES C.M. 1987.
COMMENTS: SPA, 1 year olds in actual numbers.

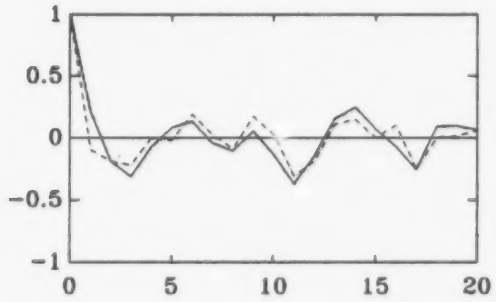
PLACIS MEAN = 7.217 SLOPE = -0.000 VAR RATIO = 0.684 N = 22

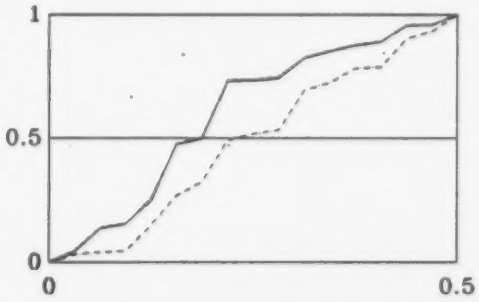




SD (0:132, 0.132, 0.154)

RHO (0.985, 0.986, 0.981)





ACF(1) (0.207, 0.212, -0.095)

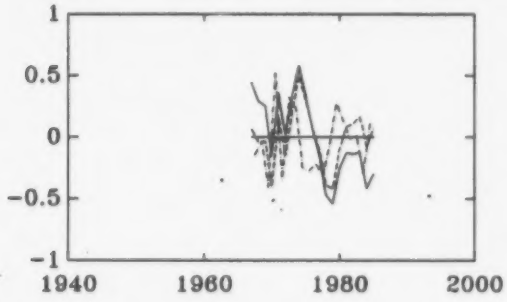
TAU (5.330, 5.466, 4.353)

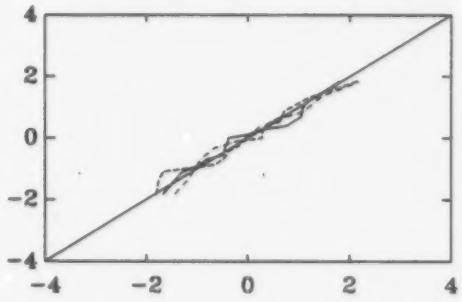
Log Transformed (base 10) Recruitment Data

..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	7.533	7.217	7.194	7.104	7.153	7.331	7.303	60-69
7.141	7.005	7.131	7.123	7.045	7.237	7.285	7.367	7.325	7.211	70-79
6.941	7.324	7.332	7.297	7.182	..	..	..	..	..	80-89

PLAICE KATTEGAT PLAIKAT
START YEAR = 67 END YEAR = 85 NUMBER OF DATA POINTS = 19
SOURCE: Report of the Division IIIa Demersal Stocks Working Groups, ICES C.M.1987.
COMMENTS: SPA, 1 year olds in (000's).

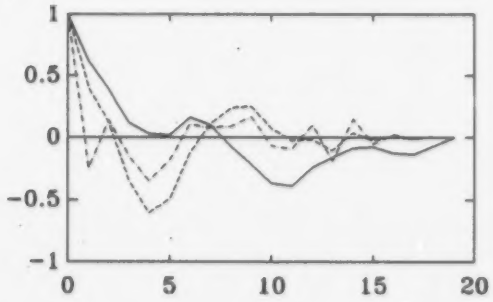
PLAIKAT MEAN = 4.393 SLOPE = -0.042 VAR RATIO = 0.315 N = 19

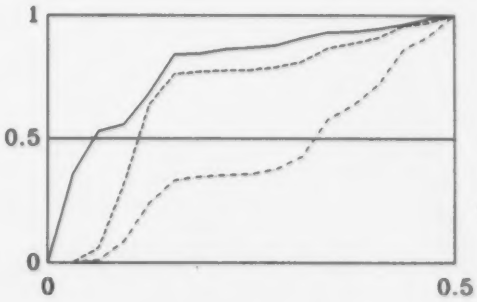




SD (0.324, 0.230, 0.257)

RHO (0.981, 0.977, 0.980)





ACF(1) (0.622, 0.406, -0.248)

TAU (17.531, 8.972, 3.051)

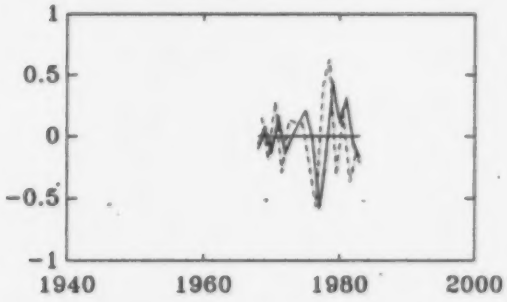
Log Transformed (base 10) Recruitment Data

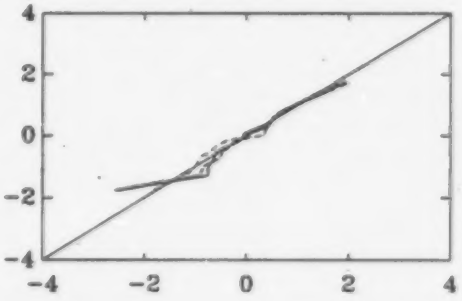
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	..	..	4.831	4.684	4.644	60-69
4.236	4.753	4.410	4.737	4.975	4.734	4.458	4.240	3.925	3.852	70-79
4.132	4.267	4.254	4.268	3.976	4.088	..	..	..	..	80-89

POLLOCK 4VWX5 POLL4VWX5
START YEAR = 68 END YEAR = 83 NUMBER OF DATA POINTS = 16
SOURCE: Annand et al., CAFSAC Res. Doc. 88/71.

COMMENTS: SPA, 2 year olds in (000's).

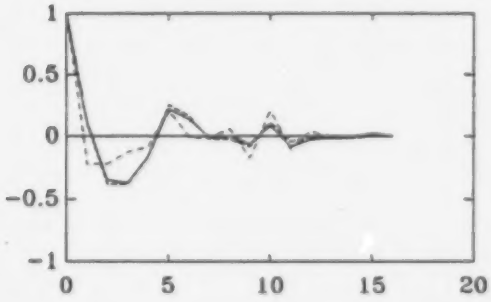
POLL4VWX5 MEAN = 4.570 SLOPE = 0.006 VAR RATIO = 0.926 N = 16

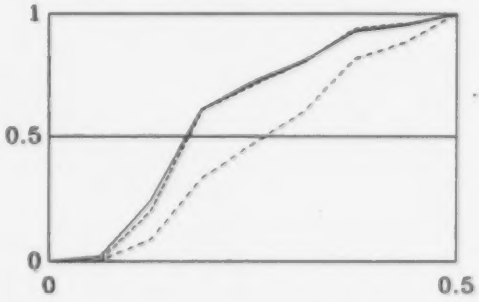




SD (0.232, 0.230, 0.315)

RHO (0.969, 0.972, 0.987)





ACF(1) (0.108, 0.091, -0.225)

TAU (5.934, 5.847, 3.777)

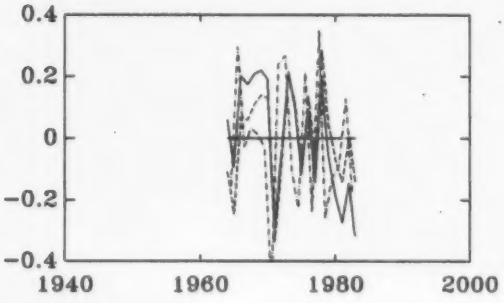
Log Transformed (base 10) Recruitment Data

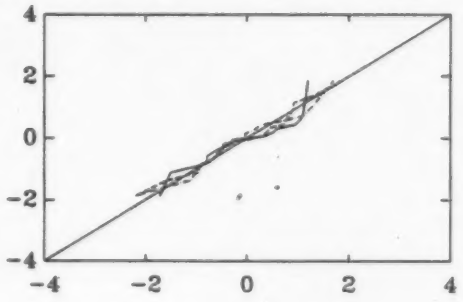
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	..	..	..	4.464	4.615	60-69
4.427	4.715	4.423	4.560	4.670	4.779	4.556	3.985	4.393	5.019	70-79
4.704	4.891	4.522	4.398	..	..	..	..	..	..	80-89

POLLOCK (SAITHE) NORTH EAST ARCTIC POLLNEAR
START YEAR - 64 END YEAR - 83 NUMBER OF DATA POINTS - 20
SOURCE: Report of the Arctic Fisheries Working Group, ICES C.M. 1988.

COMMENTS: SPA, 1 year olds in actual numbers.

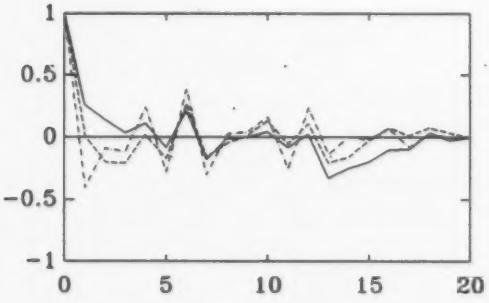
POLLNEAR MEAN = 8.459 SLOPE = -0.018 VAR RATIO = 0.696 N = 20

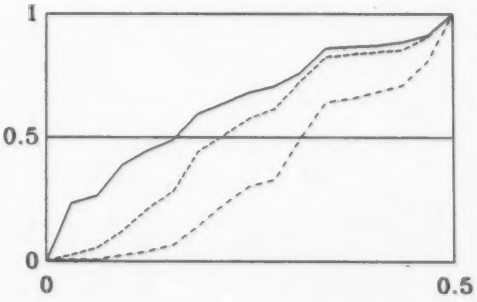




SD (0.184, 0.153, 0.217)

RHO (0.955, 0.987, 0.984)





ACF(1) (0.257, 0.009, -0.402)

TAU (6.275, 4.643, 3.191)

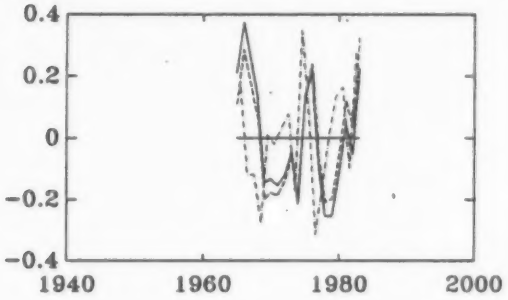
Log Transformed (base 10) Recruitment Data

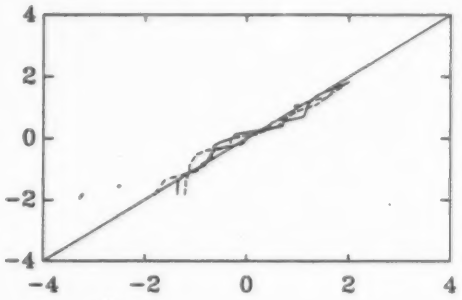
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	8.519	8.364	8.661	8.634	8.667	8.678	60-69
8.649	8.167	8.406	8.674	8.568	8.340	8.553	8.315	8.664	8.403	70-79
8.275	8.184	8.314	8.143	..	..	..	..	..	..	80-89

POLLOCK ICELAND (SAITHE) POLLICE
START YEAR = 65 END YEAR = 83 NUMBER OF DATA POINTS = 19
SOURCE: Marine Research Institute, Iceland, Mon Jun 20/1988.

COMMENTS: SPA, 3 year olds in actual numbers.

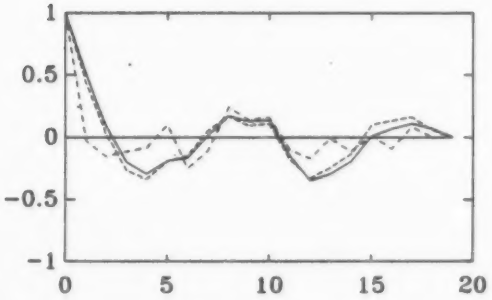
POLLICE MEAN = 7.571 SLOPE = -0.011 VAR RATIO = 0.440 N = 19

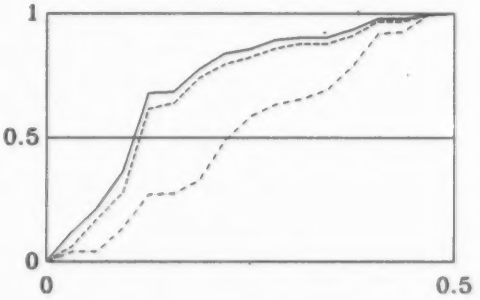




SD (0.187, 0.177, 0.175)

RHO (0.967, 0.964, 0.994)





ACF(1) (0.513, 0.435, -0.027)

TAU (9.326, 8.747, 4.496)

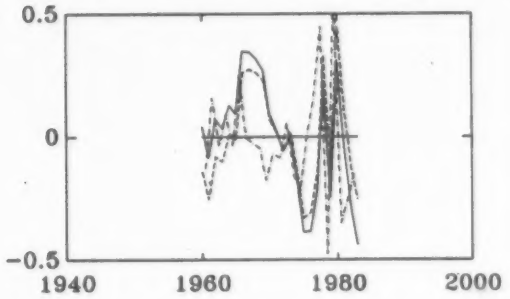
Log Transformed (base 10) Recruitment Data

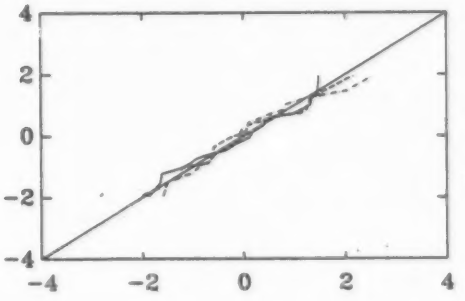
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	7.781	7.945	7.825	7.705	7.427	60-69
7.438	7.418	7.451	7.528	7.357	7.704	7.788	7.474	7.317	7.317	70-79
7.451	7.615	7.518	7.795	..	..	..	..	..	..	80-89

POLLOCK (SAITHE) FAROE POLLFA
START YEAR = 60 END YEAR = 83 NUMBER OF DATA POINTS = 24
SOURCE: Report of the North-Western Working Group,ICES C.M. 1987.

COMMENTS: SPA, 1 year olds in actual numbers.

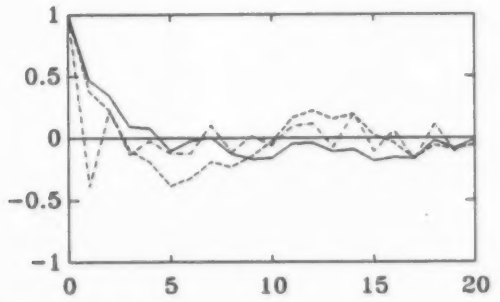
POLLFA MEAN = 7.461 SLOPE = -0.016 VAR RATIO = 0.473 N = 24

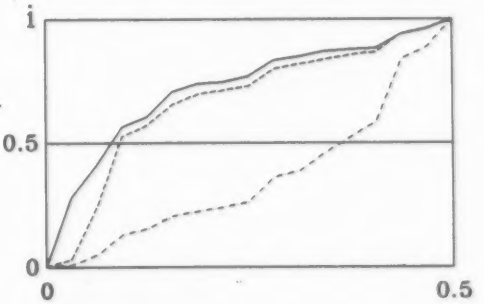




SD (0.235, 0.208, 0.229)

RHO (0.983, 0.980, 0.974)





ACF(1) (0.470, 0.377, -0.391)

TAU (12.438, 10.990, 2.747)

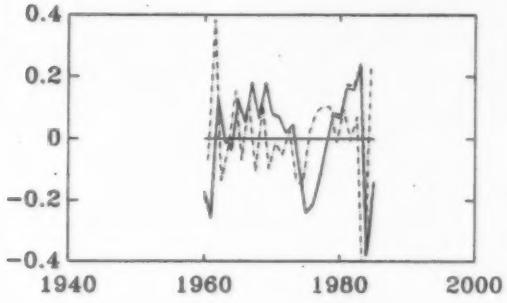
Log Transformed (base 10) Recruitment Data

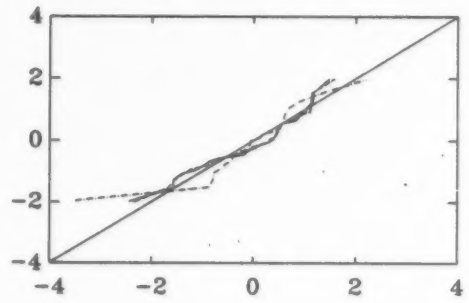
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
7.502	7.375	7.533	7.497	7.590	7.555	7.809	7.807	7.779	7.733	60-69
7.556	7.487	7.401	7.456	7.297	7.075	7.078	7.244	7.692	7.216	70-79
7.773	7.422	7.170	7.024	..	..	..	..	..	..	80-89

POLLOCK (SAITHE) VIa POLLVIa
START YEAR = 60 END YEAR = 85 NUMBER OF DATA POINTS = 26
SOURCE: Report of the North Sea Roundfish Working Group. ICES C.M. 1988.

COMMENTS: SPA, 1 year olds in actual numbers.

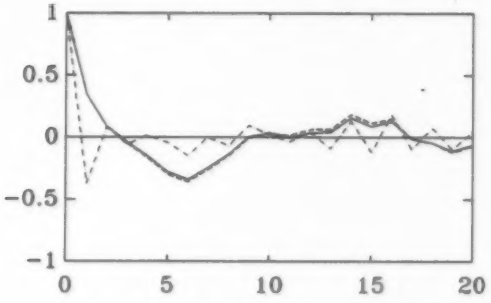
POLLVIa MEAN = 7.473 SLOPE = -0.001 VAR RATIO = 0.631 N = 26

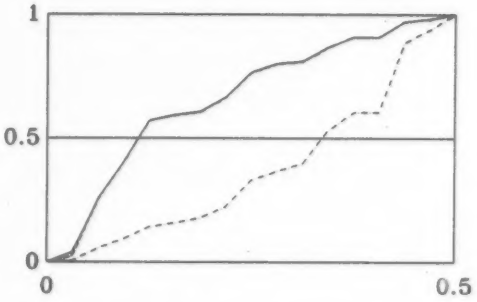




SD (0.155, 0.155, 0.174)

RHO (0.970, 0.974, 0.922)





ACF(1) (0.352, 0.347, -0.376)

TAU (8.951, 8.951, 2.970)

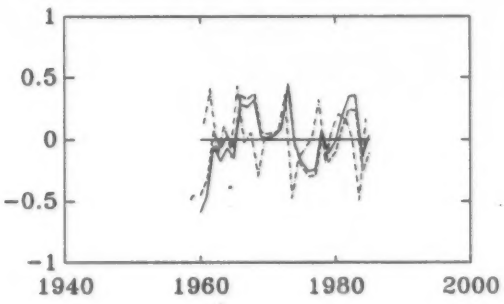
Log Transformed (base 10) Recruitment Data

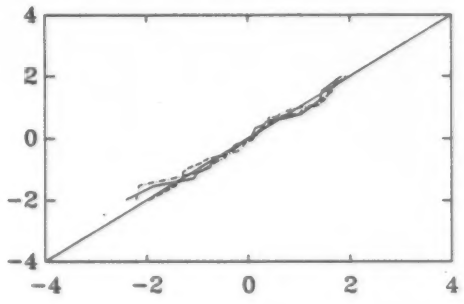
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
7.301	7.230	7.613	7.477	7.447	7.602	7.531	7.653	7.544	7.652	60-69
7.556	7.544	7.491	7.518	7.380	7.230	7.255	7.343	7.447	7.549	70-79
7.540	7.636	7.630	7.702	7.095	7.325	..	..	..	..	80-89

POLLOCK (SAITHE) NORTH SEA POLLNS
START YEAR = 60 END YEAR = 85 NUMBER OF DATA POINTS = 26
SOURCE: Report of the North Sea Roundfish Working Group. ICES C.M. 1988.

COMMENTS: SPA, 1 year olds in (000's).

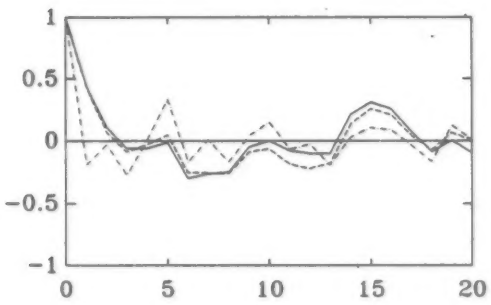
POLLNS MEAN = 5.353 SLOPE = 0.011 VAR RATIO = 0.453 N = 26

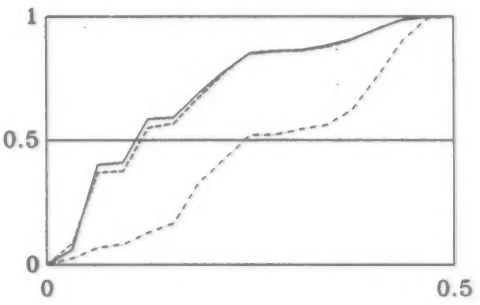




SD (0.245, 0.230, 0.233)

RHO (0.986, 0.991, 0.983)





ACF(1) (0.449, 0.427, -0.193)

TAU (9.115, 8.621, 4.105)

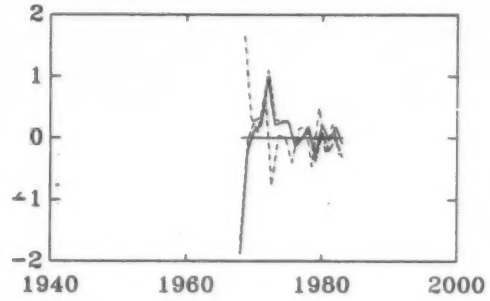
Log Transformed (base 10) Recruitment Data

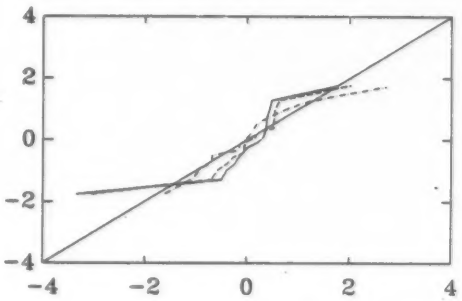
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
4.763	4.892	5.303	5.176	5.286	5.201	5.634	5.614	5.670	5.372	60-69
5.369	5.386	5.439	5.802	5.324	5.167	5.093	5.108	5.431	5.244	70-79
5.334	5.541	5.703	5.708	5.219	5.383	..	..	..	..	80-89

POUT NORWAY POUTNOR
START YEAR = 68 END YEAR = 83 NUMBER OF DATA POINTS = 16
SOURCE: Report of the Working Group on Industrial Fisheries, ICES C.M., 1987.

COMMENTS: RV (1).

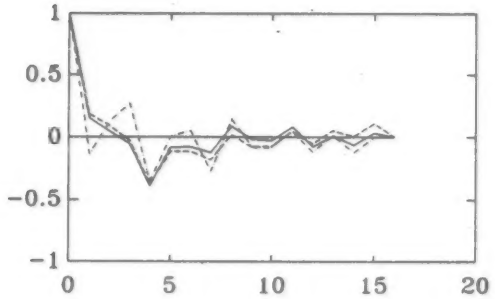
POUTNOR MEAN = 3.416 SLOPE = 0.030 VAR RATIO = 0.506 N = 16

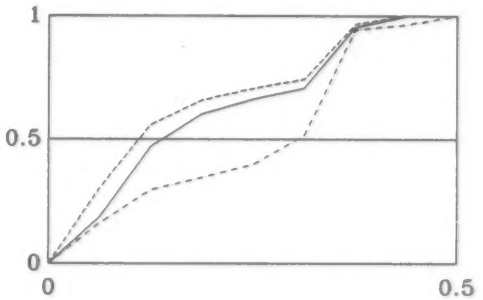




SD (0.559, 0.542, 0.562)

RHO (0.823, 0.892, 0.952)





ACF(1) (0.153, 0.183, -0.137)

TAU (7.193, 9.039, 3.284)

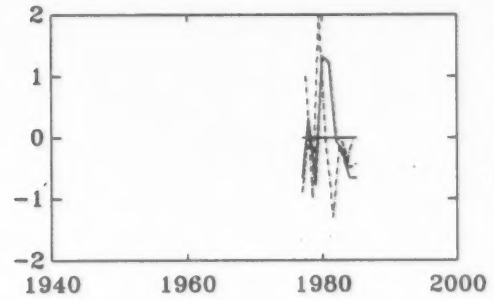
Log Transformed (base 10) Recruitment Data

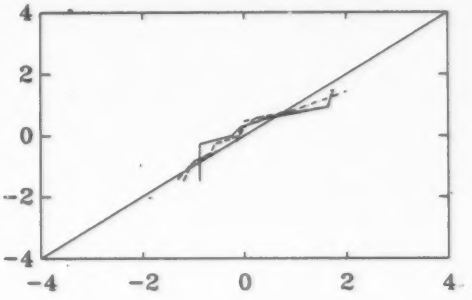
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	..	..	..	1.544	3.191	60-69
3.535	3.624	4.409	3.628	3.663	3.682	3.282	3.430	3.611	3.136	70-79
3.635	3.368	3.594	3.324	..	..	..	..	..	..	80-89

REDFISH 3NO RED3NO
START YEAR - 77 END YEAR - 85 NUMBER OF DATA POINTS - 9
SOURCE: Atkinson and Power, NAFO SRC Doc. 86/38.

COMMENTS: RV(1+2).

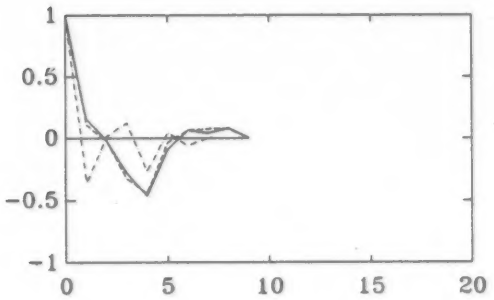
RED3NO MEAN = -0.335 SLOPE = -0.057 VAR RATIO = 0.854 N = 9

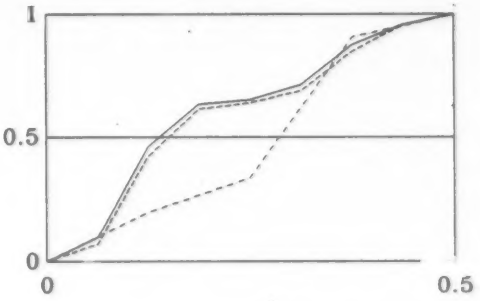




SD (0.763, 0.748, 0.997)

RHO (0.908, 0.946, 0.961)





ACF(1) (0.157, 0.111, -0.358)

TAU (7.177, 6.644, 3.495)

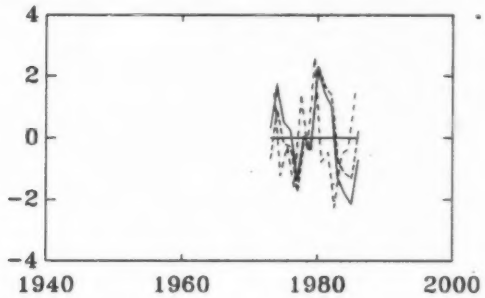
Log Transformed (base 10) Recruitment Data

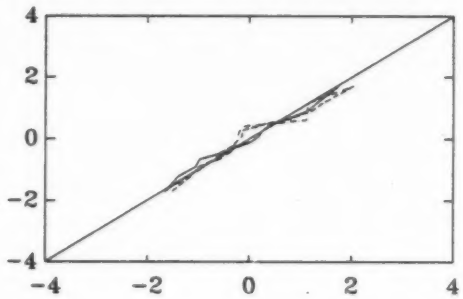
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	..	..	..	..	..	60-69
..	..	..	..	..	..	..	-1.000	0.000	-1.001	70-79
1.000	0.903	-0.398	-0.523	-1.000	-1.000	..	..	..	..	80-89

REDFISH 3Ps RED3Ps
START YEAR = 73 END YEAR = 86 NUMBER OF DATA POINTS = 14
SOURCE: Atkinson and Power, NAFO SRC Doc. 86/38.

COMMENTS: RV(1+2), index * 1000.

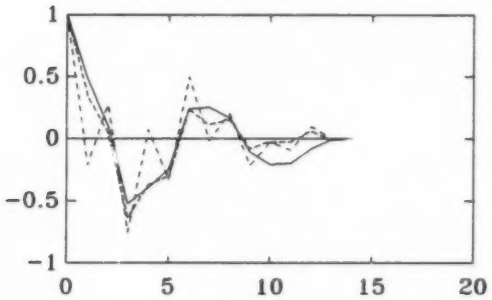
RED3Ps MEAN = 3.757 SLOPE = -0.152 VAR RATIO = 0.537 N = 14

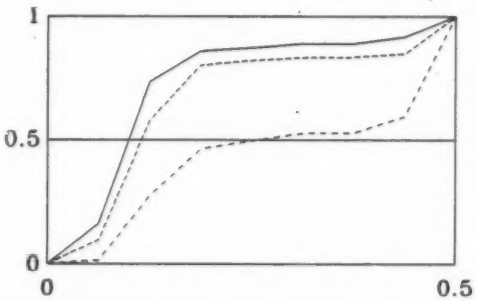




SD (1.303, 1.151, 1.351)

RHO (0.993, 0.978, 0.964)





ACF(1) (0.488, 0.344, -0.209)

TAU (10.081, 8.706, 3.866)

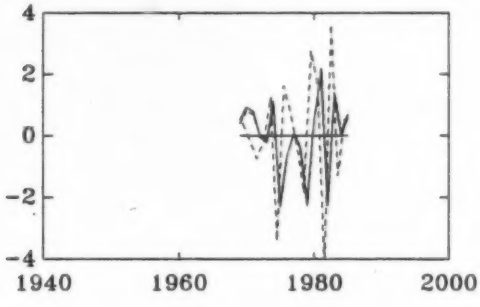
Log Transformed (base 10) Recruitment Data

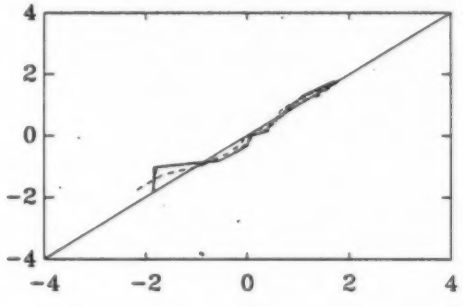
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	..	..	..	..	..	60-69
..	..	..	4.073	5.510	4.282	4.000	2.398	3.818	3.411	70-79
6.019	5.226	4.763	2.477	1.954	1.602	3.061	..	..	..	80-89

REDFISH 4VWX RED4VWX
START YEAR = 69 END YEAR = 85 NUMBER OF DATA POINTS = 17
SOURCE: Zwanenburg and Hurley, CAFSAC Res. Doc. 87/35.

COMMENTS: RV(1+2).

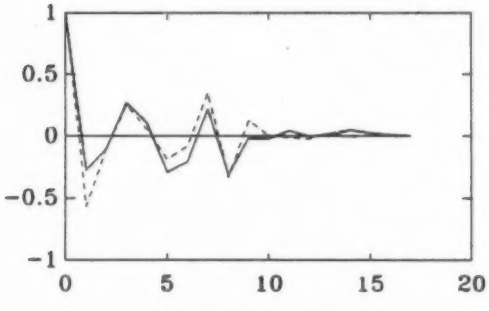
RED4VWX MEAN = 5.276 SLOPE = -0.015 VAR RATIO = 1.338 N = 17

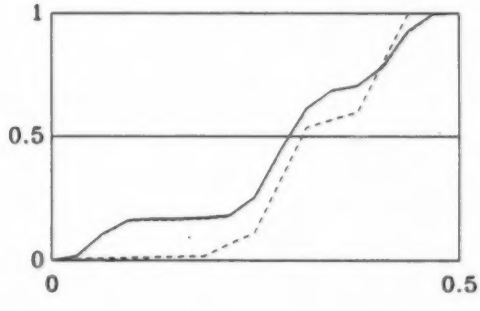




SD (1.239, 1.237, 2.027)

RHO (0.955, 0.961, 0.986)





ACF(1) (-0.271, -0.277, -0.569)

TAU (3.426, 3.423, 3.252)

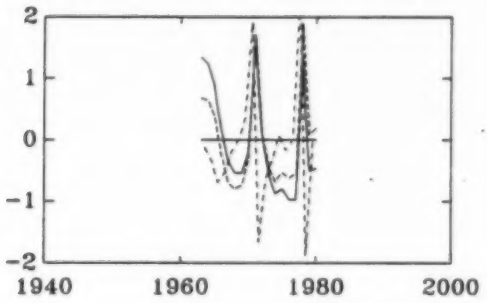
Log Transformed (base 10) Recruitment Data

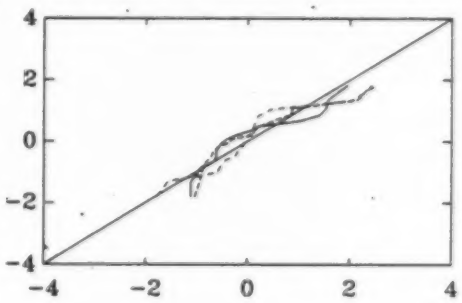
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	..	..	..	..	5.786	60-69
6.199	6.065	5.306	5.122	6.400	3.000	4.615	5.346	4.874	3.000	70-79
5.790	7.398	3.000	6.623	5.311	5.863	..	..	..	..	80-89

REDFISH 5YZ RED5YZ
START YEAR = 63 END YEAR = 80 NUMBER OF DATA POINTS = 18
SOURCE: Woods Hole Ref. Doc. 86-09, JNWAFS, 2:13.

COMMENTS: SPA, 1 year olds in (000's).

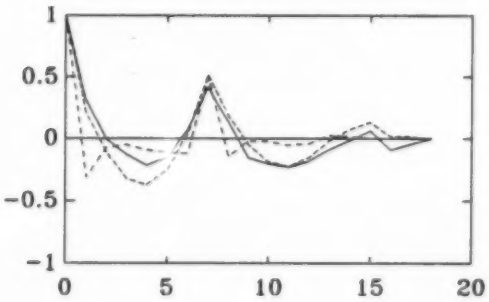
RED5YZ MEAN = 0.580 SLOPE = -0.078 VAR RATIO = 0.645 N = 18

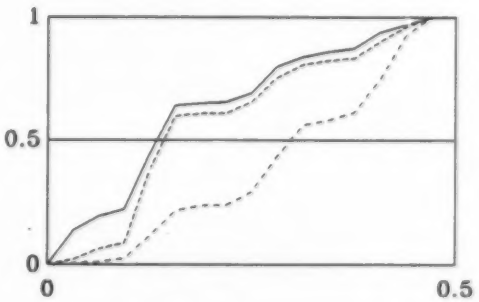




SD (0.878, 0.780, 0.998)

RHO (0.935, 0.926, 0.923)





ACF(1) (0.310, 0.204, -0.311)

TAU (7.473, 7.028, 3.361)

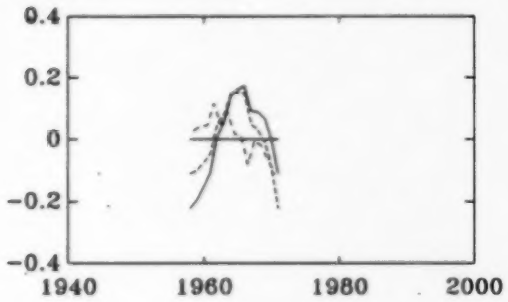
Log Transformed (base 10) Recruitment Data

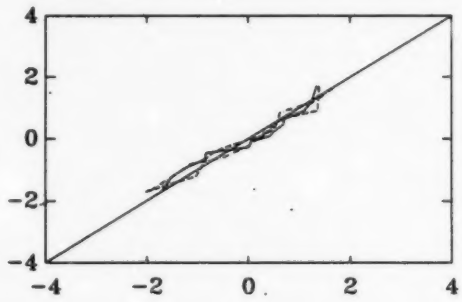
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	1.926	1.810	1.470	0.771	0.230	0.041	0.039	60-69
0.380	2.295	0.633	0.000	-0.301	-0.222	-0.398	-0.398	1.960	0.078	70-79
0.114	..	..	..	..	..	..	..	..	..	80-89

REDFISH ICELAND REDICE
START YEAR - 58 END YEAR - 71 NUMBER OF DATA POINTS - 14
SOURCE: Marine Research Institute, Iceland, Mon Jun 20/1988.

COMMENTS: SPA, 11 year olds in actual numbes.

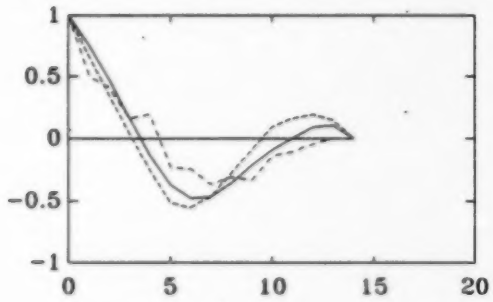
REDICE MEAN = 8.306 SLOPE = 0.017 VAR RATIO = 0.118 N = 14

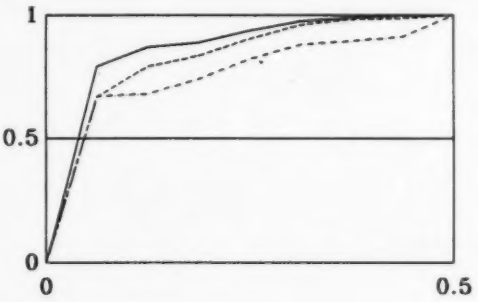




SD (0.130, 0.110, 0.063)

RHO (0.971, 0.978, 0.983)





ACF(1) (0.757, 0.662, 0.507)

TAU (25.250, 21.327, 21.419)

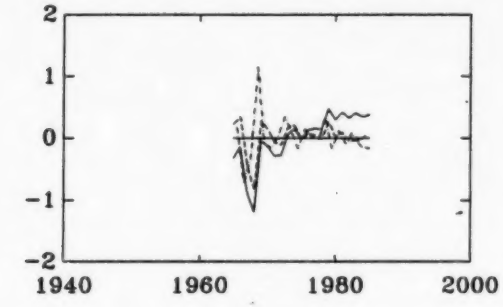
Log Transformed (base 10) Recruitment Data

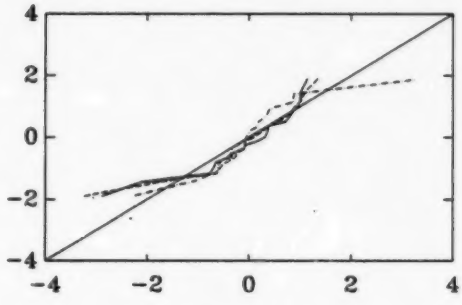
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	8.084	8.111	50-59
8.154	8.198	8.314	8.361	8.448	8.467	8.481	8.399	8.395	8.373	60-69
8.308	8.195	..	..	..	..	..	..	..	..	70-79
..	..	..	..	..	..	..	..	..	..	80-89

REDFISH I&II REDI&II
START YEAR = 65 END YEAR = 85 NUMBER OF DATA POINTS = 21
SOURCE: Report of the Arctic Fisheries Working Group, ICES C.M. 1988.

COMMENTS: RV(0), 0-group survey abudance indices.

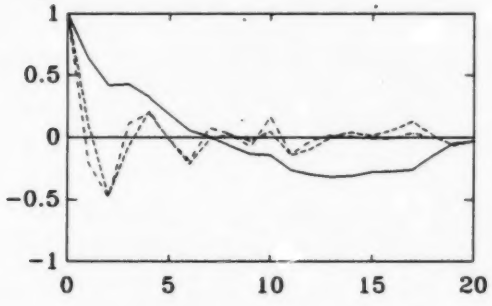
REDI&II MEAN = 2.519 SLOPE = 0.054 VAR RATIO = 0.341 N = 21

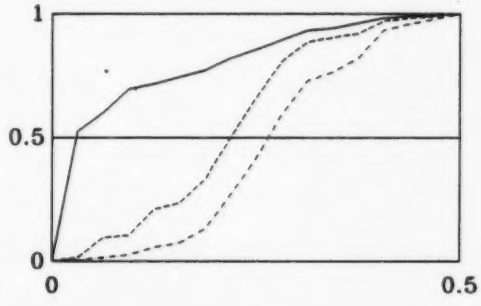




SD (0.414, 0.253, 0.342)

RHO (0.926, 0.920, 0.904)





ACF(1) (0.638, 0.103, -0.202)

TAU (33.586, 4.572, 3.772)

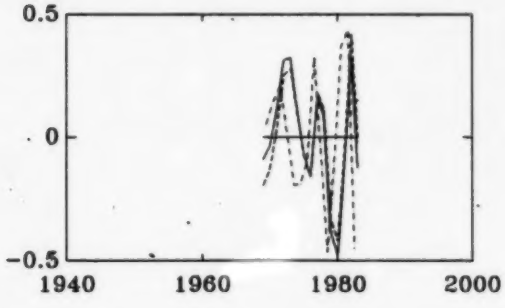
Log Transformed (base 10) Recruitment Data

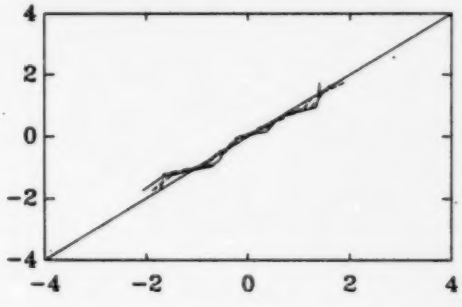
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	2.201	2.373	1.643	1.322	2.469	60-69
2.393	2.236	2.248	2.585	2.670	2.498	2.650	2.674	2.663	2.990	70-79
2.814	2.935	2.841	2.930	2.865	2.900	..	..	..	..	80-89

SCALLOPS 5Ze SCALL5Ze
START YEAR = 69 END YEAR = 83 NUMBER OF DATA POINTS = 15
SOURCE: Mohn et al., CAFSAC Res. Doc. 87/9.

COMMENTS: SPA, 3 year olds in (000 000's).

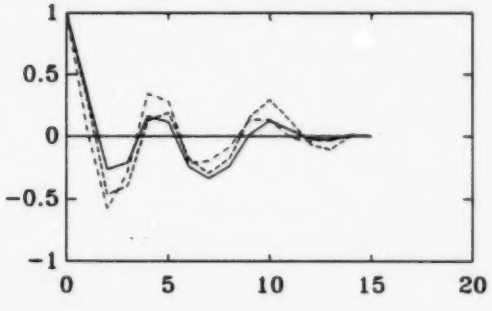
SCALL5Ze MEAN = 2.764 SLOPE = -0.015 VAR RATIO = 0.672 N = 15

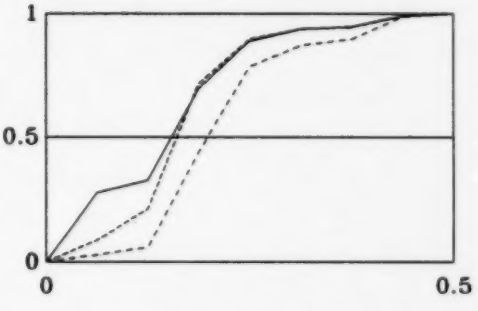




SD (0.232, 0.222, 0.269)

RHO (0.977, 0.997, 0.986)





ACF(1) (0.358, 0.289, 0.045)

TAU (6.484, 6.223, 5.034)

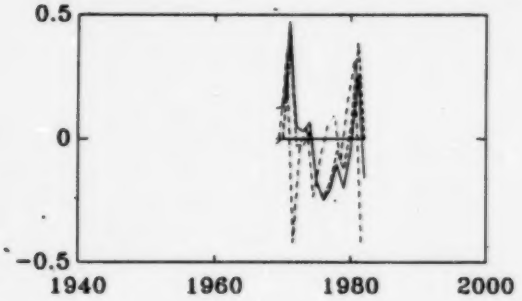
Log Transformed (base 10) Recruitment Data

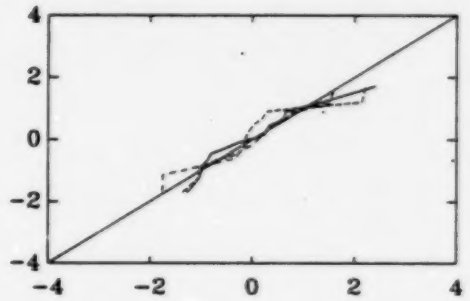
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	..	..	..	..	2.676	60-69
2.726	2.870	3.074	3.086	2.893	2.703	2.604	2.928	2.849	2.386	70-79
2.286	2.651	3.089	2.639	..	..	..	..	..	..	80-89

SILVER HAKE 4VWX SHAKE4VWX
START YEAR = 69 END YEAR = 82 NUMBER OF DATA POINTS = 14
SOURCE: Fanning et al., NAFO SCR Doc. 87/56.

COMMENTS: SPA, 1 year olds in (000's).

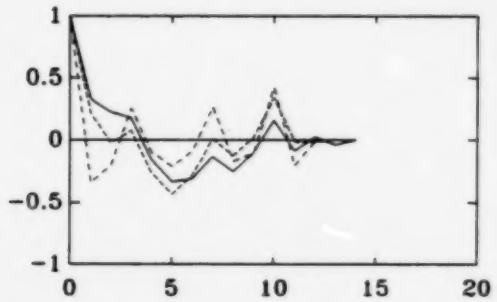
SHAKE4VWX MEAN = 6.107 SLOPE = -0.022 VAR RATIO = 0.671 N = 14

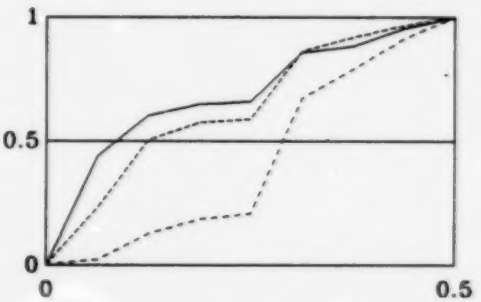




SD (0.196, 0.174, 0.227)

RHO (0.962, 0.916, 0.977)





ACF(1) (0.334, 0.210, -0.345)

TAU (11.714, 8.074, 3.457)

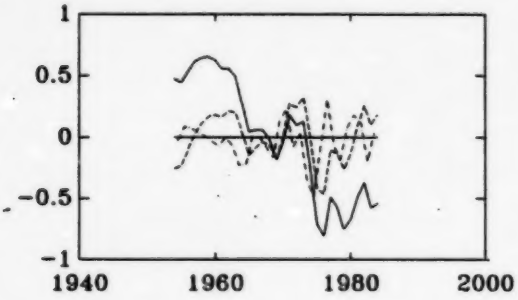
Log Transformed (base 10) Recruitment Data

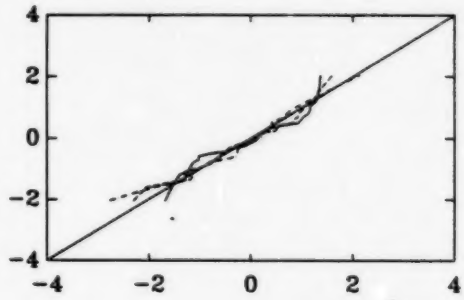
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	..	..	..	..	6.232	60-69
6.234	6.578	6.158	6.137	6.174	5.938	5.858	5.906	6.004	5.907	70-79
6.056	6.370	5.949	..	..	..	..	..	..	..	80-89

SILVER HAKE 5Ze SHAKE5Ze
START YEAR = 54 END YEAR = 84 NUMBER OF DATA POINTS = 31
SOURCE: Almeida, Woods Hole Ref. Doc. 87-03.

COMMENTS: SPA, 1 year olds in (000 000's).

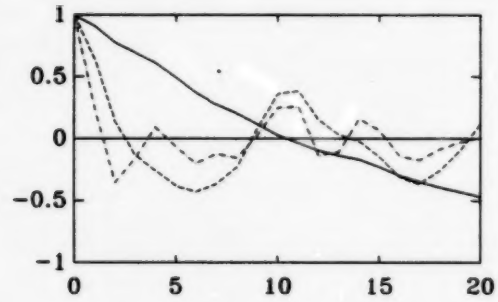
SHAKE5Ze MEAN = 2.451 SLOPE = -0.049 VAR RATIO = 0.058 N = 31

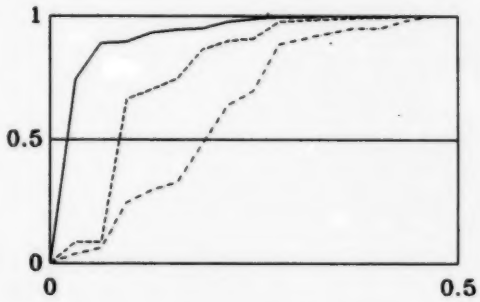




SD (0.480, 0.201, 0.163)

RHO (0.966, 0.985, 0.983)





ACF(1) (0.905, 0.638, 0.237)

TAU (47.571, 11.788, 5.245)

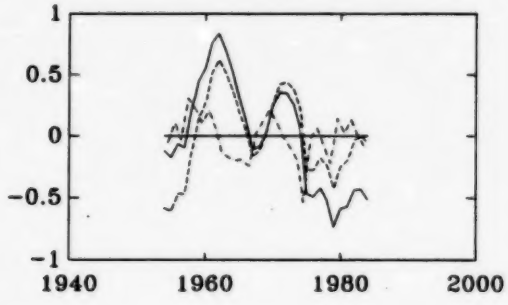
Log Transformed (base 10) Recruitment Data

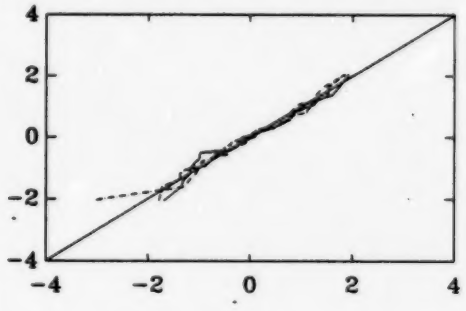
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	2.924	2.897	2.987	3.064	3.096	3.105	50-59
3.076	3.007	3.008	2.945	2.718	2.498	2.510	2.512	2.435	2.267	60-69
2.408	2.631	2.548	2.580	2.233	1.747	1.646	1.960	1.883	1.704	70-79
1.781	1.961	2.077	1.874	1.907	..	..	..	..	..	80-89

SILVER HAKE MAB (5Zw6) SHAKEMAB
START YEAR = 54 END YEAR = 84 NUMBER OF DATA POINTS = 31
SOURCE: Almeida, Woods Hole Ref. Doc. 87-03.

COMMENTS: SPA, 1 year olds in (000 000's).

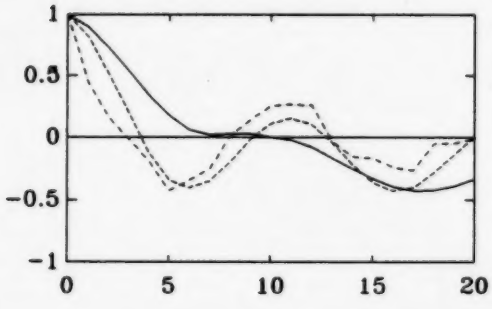
SHAKEMAB MEAN = 2.793 SLOPE = -0.031 VAR RATIO = 0.080 N = 31

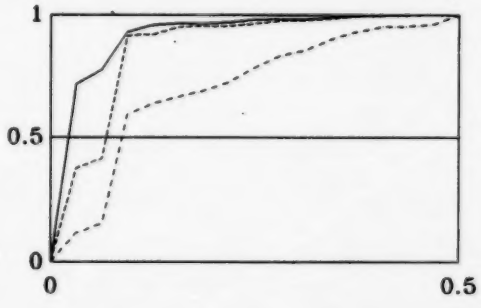




SD (0.438, 0.339, 0.175)

RHO (0.983, 0.989, 0.977)





ACF(1) (0.898, 0.822, 0.446)

TAU (45.794, 14.742, 11.468)

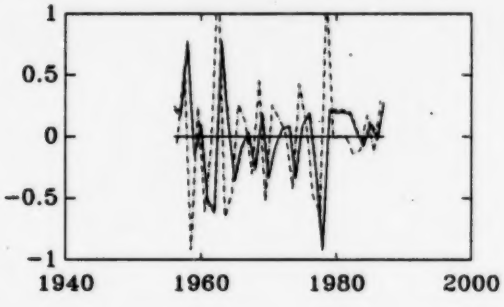
Log Transformed (base 10) Recruitment Data

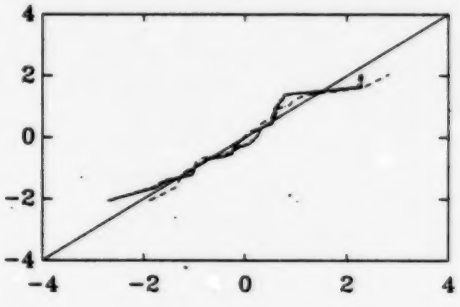
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	2.673	2.620	2.728	2.696	3.007	3.238	50-59
3.344	3.552	3.632	3.493	3.319	3.120	2.929	2.688	2.705	2.825	60-69
3.038	3.153	3.143	3.053	2.866	2.327	2.302	2.369	2.277	2.059	70-79
2.203	2.224	2.357	2.361	2.276	..	..	..	..	..	80-89

SOLE NORTH SEA SOLENS
START YEAR - 56 END YEAR - 87 NUMBER OF DATA POINTS - 32
SOURCE: Report of the North Sea Flatfish Working Group ICES C.M. 1988.

COMMENTS: SPA, 1 year olds in (000 000's).

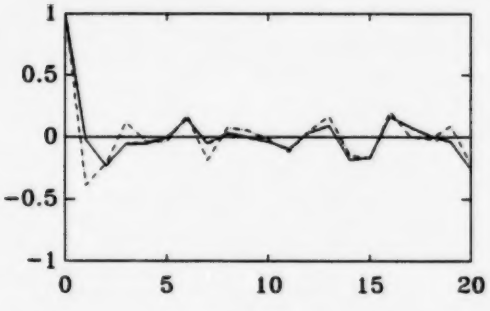
SOLENS MEAN = 1.962 SLOPE = -0.002 VAR RATIO = 1.036 N = 32

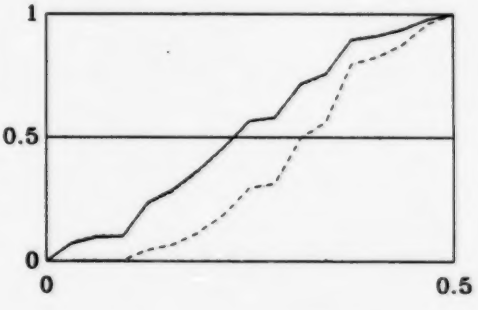




SD (0.339, 0.338, 0.488)

RHO (0.961, 0.964, 0.971)





ACF(1) (-0.021, -0.024, -0.392)

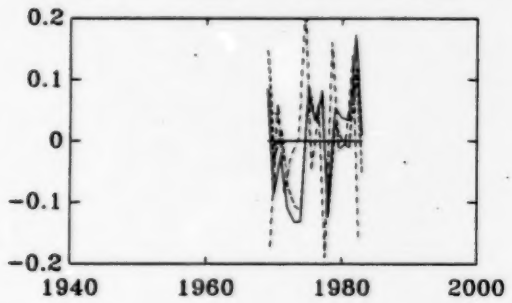
TAU (4.345, 4.330, 3.187)

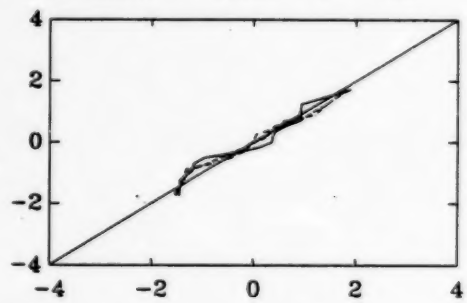
Log Transformed (base 10) Recruitment Data

..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	2.212	2.158	2.738	1.820	50-59
2.061	1.447	1.362	2.742	2.083	1.613	1.875	2.000	1.699	2.150	60-69
1.623	1.881	2.025	2.045	1.623	2.053	2.146	1.672	1.041	2.176	70-79
2.155	2.158	2.140	1.996	1.881	2.057	1.929	2.220	..	..	80-89

SOLE CELTIC SEA (VIIe & VIIg) SOLECS
START YEAR - 69 END YEAR - 83 NUMBER OF DATA POINTS - 15
SOURCE: Report of the Irish Sea and Bristol Channel Working Group, ICES C.M. 1987.
COMMENTS: SPA, 2 year olds in actual numbers.

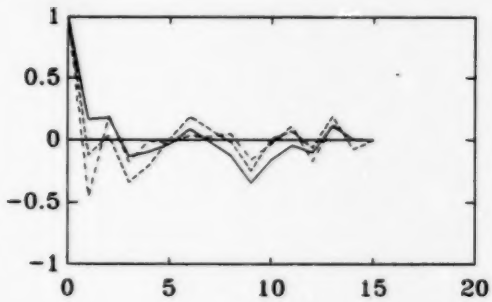
SOLECS MEAN = 6.616 SLOPE = 0.009 VAR RATIO = 0.859 N = 15

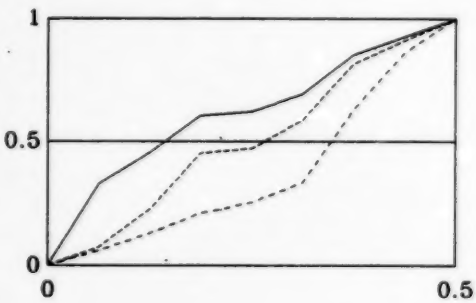




SD (0.091, 0.082, 0.119)

RHO (0.966, 0.990, 0.985)





ACF(1) (0.167, -0.122, -0.457)

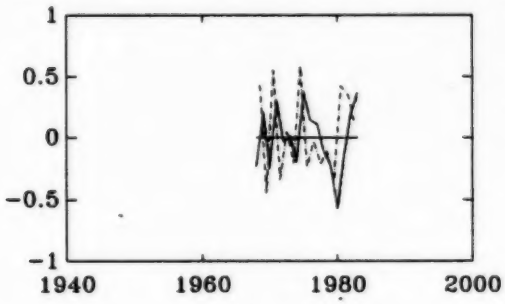
TAU (6.953, 3.754, 2.877)

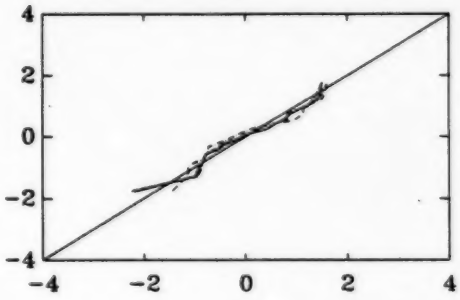
Log Transformed (base 10) Recruitment Data

..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	..	..	..	..	6.700	60-69
6.529	6.590	6.506	6.483	6.485	6.699	6.649	6.699	6.510	6.668	70-79
6.654	6.650	6.789	6.627	..	..	..	..	..	..	80-89

SOLE IRISH SEA (VIIa) SOLEIS
START YEAR - 68 END YEAR - 83 NUMBER OF DATA POINTS - 16.
SOURCE: Report of the Irish Sea and Bristol Channel Working Group, ICES C.M. 1987.
COMMENTS: SPA, 2 year olds in acutal numbers.

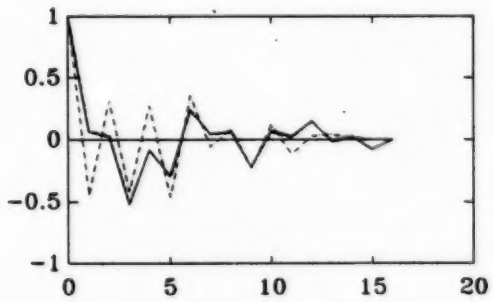
SOLEIS MEAN = 6.830 SLOPE = 0.003 VAR RATIO = 0.887 N = 16

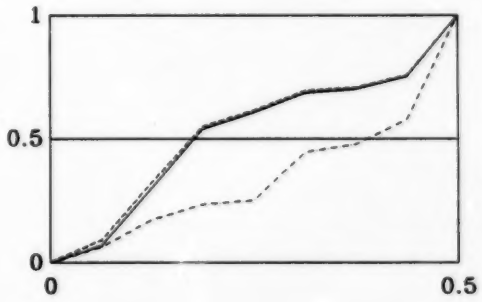




SD (0.255, 0.255, 0.340)

RHO (0.982, 0.978, 0.968)





ACF(1) (0.065, 0.076, -0.451)

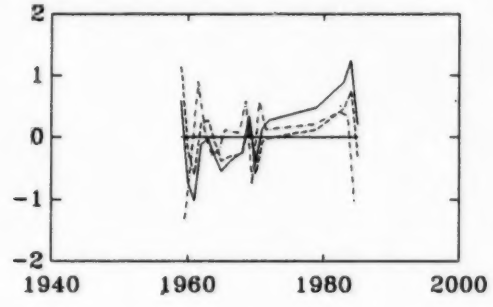
TAU (5.642, 5.756, 2.568)

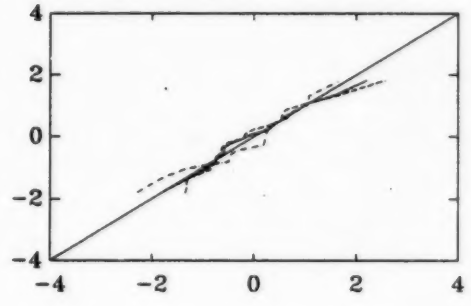
Log Transformed (base 10) Recruitment Data

..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	..	..	..	6.597	7.024	60-69
6.578	7.133	6.792	6.837	6.631	7.213	6.973	6.940	6.725	6.616	70-79
6.272	6.695	7.057	7.199	..	..	..	..	..	..	80-89

SOLE IIIa SOLIIIa
START YEAR - 59 END YEAR - 85 NUMBER OF DATA POINTS - 18
SOURCE: Report of the Division IIIa Demersal Stocks Working Groups
ICES C.M.1987.
COMMENTS: RV (1).

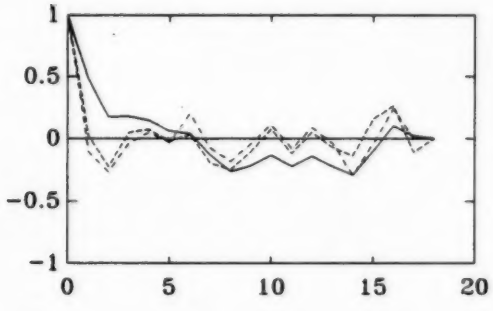
SOLIIIa MEAN = 0.024 SLOPE = 0.065 VAR RATIO = 0.509 N = 18

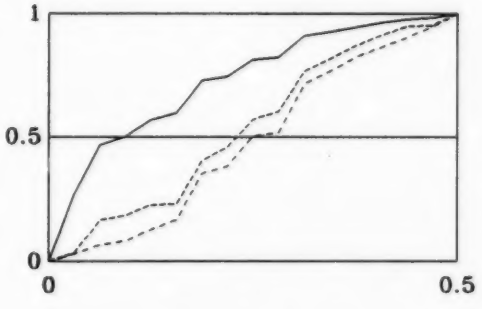




SD (0.561, 0.447, 0.567)

RHO (0.991, 0.962, 0.966)





ACF(1) (0.484, 0.023, -0.107)

TAU (11.006, 4.340, 4.007)

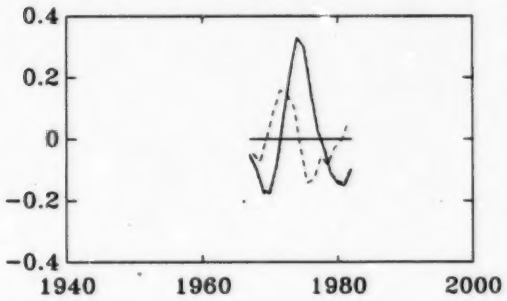
Log Transformed (base 10) Recruitment Data

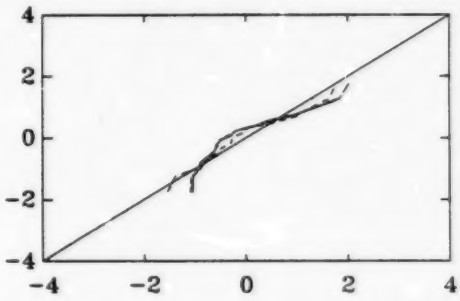
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	0.613	50-59
-0.699	-1.000	-0.097	0.000	-0.301	-0.523	-0.398	-0.301	-0.222	0.362	60-69
-0.398	0.176	0.301	..	..	..	..	..	..	0.504	70-79
..	..	..	0.914	1.262	0.230	..	..	..	..	80-89

WHITE HAKE 4T WHAKE4T
START YEAR - 67 END YEAR - 82 NUMBER OF DATA POINTS - 16
SOURCE: Clay CAFSAC Res. Doc. 87/81.

COMMENTS: SPA, 3 year olds in (000's).

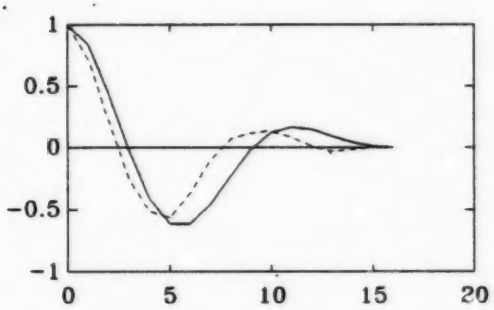
WHAKE4T MEAN = 3.746 SLOPE = -0.001 VAR RATIO = 0.158 N = 16

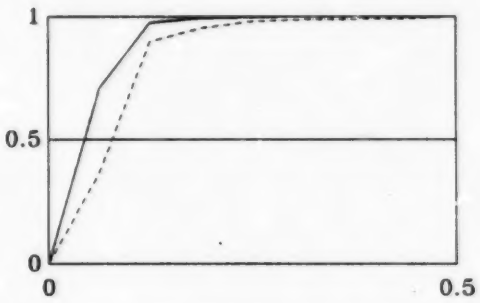




SD (0.163, 0.162, 0.091)

RHO (0.938, 0.940, 0.981)





ACF(1) (0.837, 0.838, 0.719)

TAU (22.684, 22.732, 12.787)

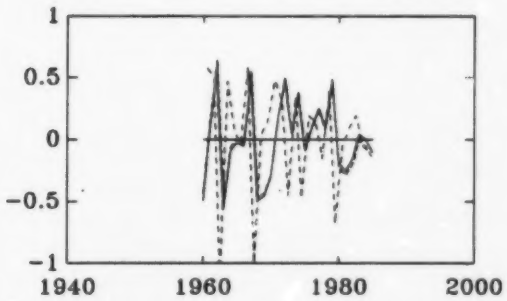
Log Transformed (base 10) Recruitment Data

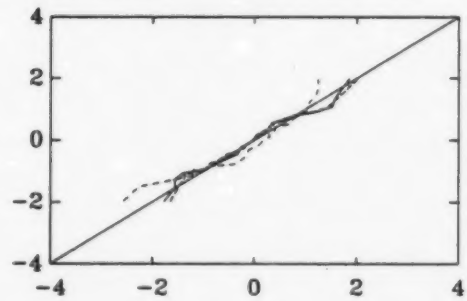
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	..	..	..	3.697	3.650	3.575	60-69
3.576	3.665	3.823	3.968	4.075	4.046	3.902	3.772	3.714	3.629	70-79
3.601	3.595	3.648	..	..	..	..	..	..	..	80-89

WHITING VIa WHITVIa
START YEAR - 60 END YEAR - 85 NUMBER OF DATA POINTS - 26
SOURCE: Report of the North Sea Roundfish Working Group. ICES C.M. 1988.

COMMENTS: SPA, 1 year olds in (000's).

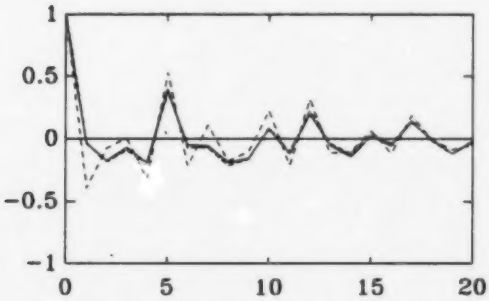
WHITVIa MEAN = 4.795 SLOPE = 0.005 VAR RATIO = 1.022 N = 26

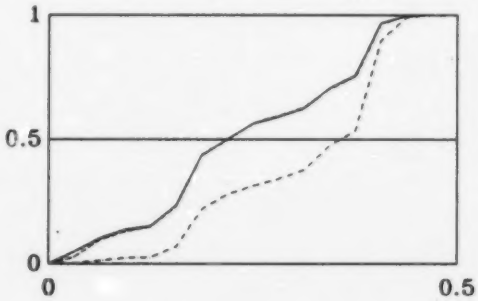




SD (0.319, 0.317, 0.456)

RHO (0.987, 0.988, 0.950)





ACF(1) (−0.032, −0.036, −0.397)

TAU (4.569, 4.561, 2.808)

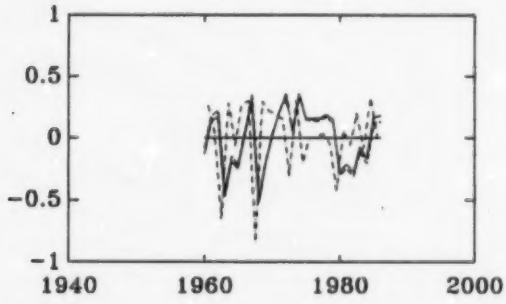
Log Transformed (base 10) Recruitment Data

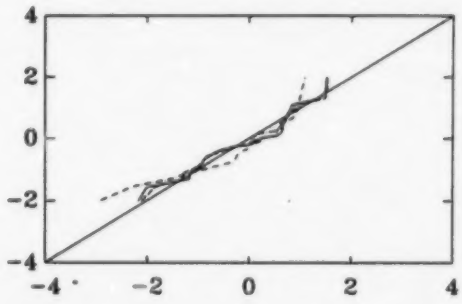
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
4.301	4.875	5.386	4.230	4.699	4.771	4.740	5.322	4.301	4.341	60-69
4.491	4.969	5.290	4.833	5.179	4.708	4.903	5.050	4.896	5.282	70-79
4.600	4.544	4.643	4.838	4.789	4.692	..	..	..	..	80-89

WHITING NORTH SEA WHITNS
START YEAR - 60 END YEAR - 86 NUMBER OF DATA POINTS - 27
SOURCE: Report of the North Sea Roundfish Working Group. ICES C.M. 1988.

COMMENTS: SPA, 0 year olds in actual numbers.

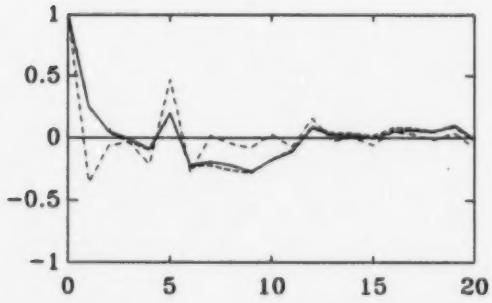
WHITNS MEAN = 10.593 SLOPE = 0.004 VAR RATIO = 0.758 N = 27

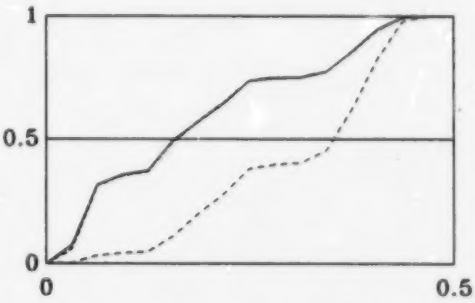




SD (0.238, 0.236, 0.293)

RHO (0.971, 0.977, 0.929)





ACF(1) (0.252, 0.249, -0.358)

TAU (6.337, 6.241, 2.838)

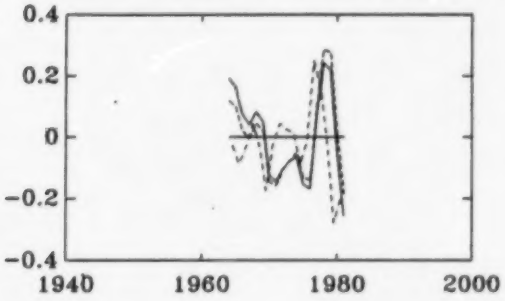
Log Transformed (base 10) Recruitment Data

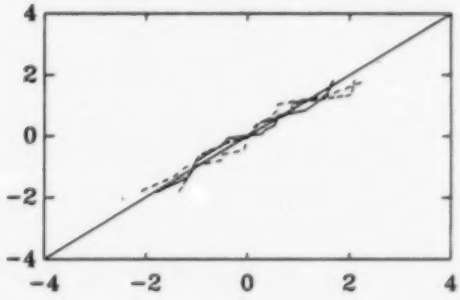
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
10.459	10.724	10.770	10.120	10.407	10.344	10.619	10.919	10.079	10.379	60-69
10.602	10.792	10.949	10.643	10.954	10.748	10.748	10.748	10.783	10.739	70-79
10.317	10.376	10.316	10.518	10.429	10.759	10.775	..	..	..	80-89

YELLOWTAIL FLOUNDER 3NO YELL3NO
START YEAR = 64 END YEAR = 81 NUMBER OF DATA POINTS = 18
SOURCE: Brodie NAFO SRC Doc. 86/40.

COMMENTS: SPA, 5 year olds in (000's).

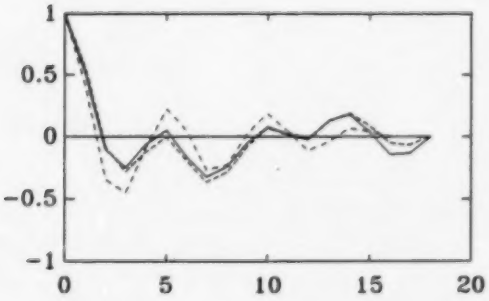
YELL3NO MEAN = 5.003 SLOPE = -0.009 VAR RATIO = 0.352 N = 18

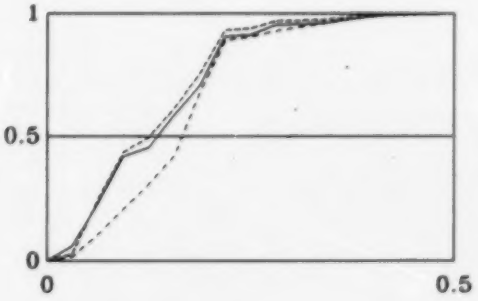




SD (0.144, 0.137, 0.121)

RHO (0.982, 0.967, 0.968)





ACF(1) (0.513, 0.553, 0.404)

TAU (7.355, 7.925, 6.023)

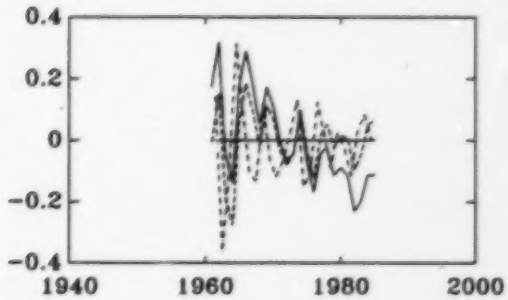
Log Transformed (base 10) Recruitment Data

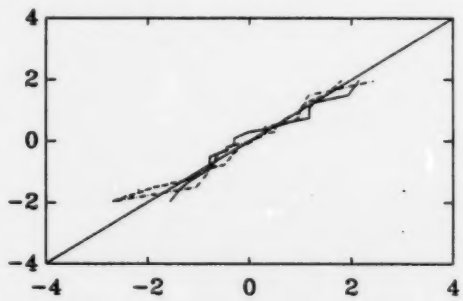
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	..	..	..	5.195	5.167	5.079	5.044	5.086	5.052	60-69
4.879	4.855	4.900	4.924	4.939	4.848	4.834	5.084	5.244	5.225	70-79
4.947	4.745	..	..	..	..	..	..	..	..	80-89

YELLOWTAIL FLOUNDER 5Z YELL5Z
START YEAR - 61 END YEAR - 85 NUMBER OF DATA POINTS - 25
SOURCE: Woods Hole Ref. Doc. 86-09.

COMMENTS: RV(1+2).

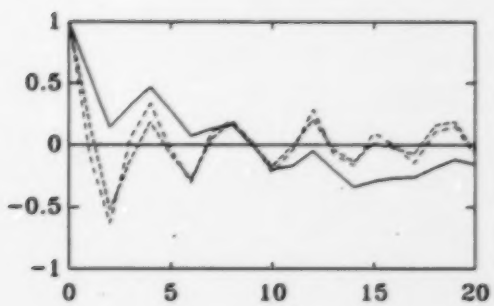
YELL5Z MEAN = 0.345 SLOPE = -0.015 VAR RATIO = 0.410 N = 25

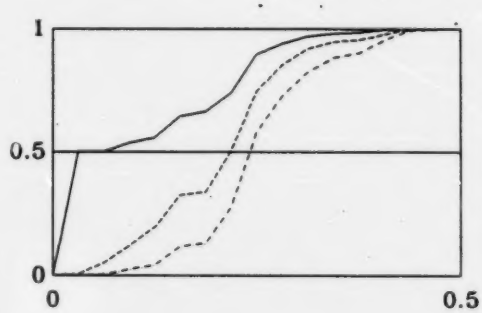




SD (0.148, 0.102, 0.134)

RHO (0.971, 0.981, 0.970)





ACF(1) (0.564, 0.160, -0.091)

TAU (32.147, 4.585, 4.133)

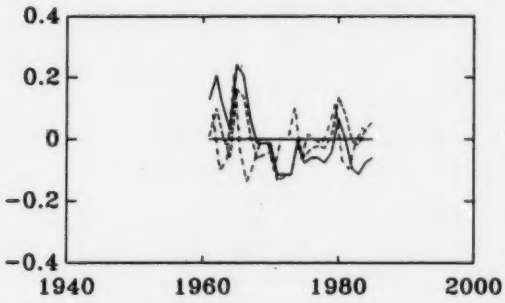
Log Transformed (base 10) Recruitment Data

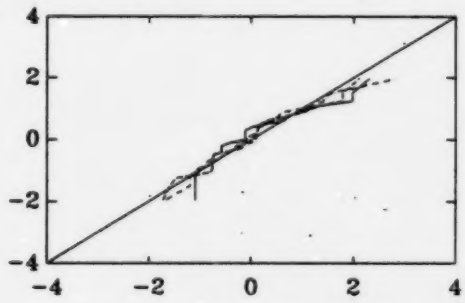
..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	0.519	0.663	0.301	0.204	0.519	0.633	0.531	0.398	0.518	60-69
0.462	0.342	0.279	0.301	0.431	0.279	0.176	0.301	0.322	0.230	70-79
0.255	0.230	0.114	0.146	0.230	0.230	..	..	..	..	80-89

YELLOWTAIL FLOUNDER S.N.E. YELLSNE
START YEAR - 61 END YEAR - 85 NUMBER OF DATA POINTS - 25
SOURCE: Woods Hole Ref. Doc. 86-09.

COMMENTS: RV(1+2).

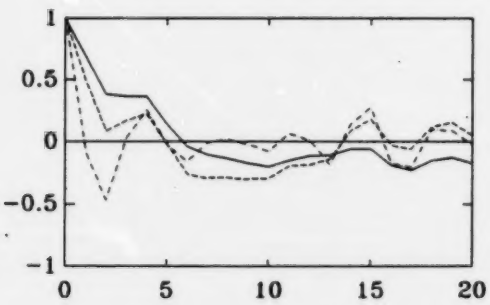
YELLSNE MEAN = 0.475 SLOPE = -0.010 VAR RATIO = 0.280 N = 25

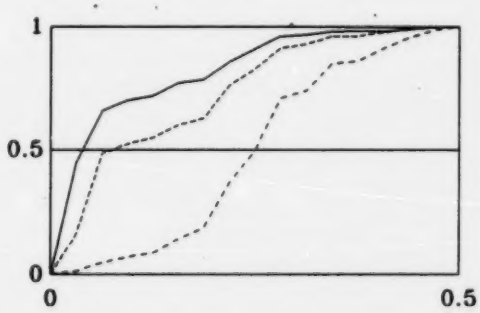




SD (0.104, 0.077, 0.078)

RHO (0.942, 0.981, 0.970)





ACF(1) (0.692, 0.494, -0.092)

TAU (25.403, 13.234, 3.989)

Log Transformed (base 10) Recruitment Data

..	..	..	..	..	..	..	..	..	..	40-49
..	..	..	..	..	..	..	..	..	..	50-59
..	0.602	0.681	0.580	0.505	0.716	0.681	0.544	0.462	0.461	60-69
0.462	0.362	0.362	0.362	0.462	0.398	0.415	0.415	0.398	0.430	70-79
0.544	0.477	0.380	0.362	0.398	0.415	..	..	..	..	80-89